Eco-Rating Exercise – Jaipur Terminal (Rajasthan)

Prepared for **Indian Oil Corporation Limited**

TERI Project Report No. 2000EE61

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List of abbreviations

AAQ	Ambient Air quality
BOD	Biochemical Oxygen Demand
BPCL	Bharat Petroleum Corporation Limited
CMP	Contingency Management Plan
COD	Chemical Oxygen Demand
CPCB	Central Pollution Control Board
DG	Diesel Generator
DMP	Disaster Management Plan
EIA	Environmental Impact Assessment
EIL	Engineers India Limited
EMS	Environmental Management System
ERS	Eco-Rating System
ETP	Effluent Treatment Plant
HPCL	Hindustan Petroleum Corporation Limited
HSD	High Speed Diesel
IOC	Indian Oil Corporation Limited
ISO	International Organization for Standardisation
MS	Motor Spirit
NO_x	Oxides of Nitrogen
OISD	Oil Industries Safety Directorate
OWS	Oil Water Separator
PPE	Personal Protective Equipment
PIL	Public Interest Litigation
RSPCB	Rajasthan State Pollution Control Board
RSP	Respirable Suspended Particles
SKO	Super Kerosene Oil
SO_2	Sulphur Dioxide
SPM	Suspended Particulate Matter
TLF	Truck Loading Facility
TSS	Total Suspended Solids
TT	Tank Trolley
USEPA	United States Environmental Protection Agency
VCE	Vapour Cloud Explosion
VOCs	Volatile Organic Compounds

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Background

In May 2000, Indian Oil Corporation's (IOC) Marketing Division gave TERI the mandate to perform an Eco-Rating exercise for their oil storage terminal in Jaipur. A site visit was performed between September 25–27, 2000. This report describes the main findings of the Eco-Rating exercise, and the ratings assigned for the facility.

Scope of the exercise

The rating exercise was to cover the following aspects of the terminal:

- Storage facilities
- Loading and despatch of product

Key aspects addressed are pollution arising from routine operations, and risk of contamination/ fire arising from abnormal situations.

The process of rating encompassed collection of primary and secondary data on various parameters identified under the rating construct, and processing of the same to arrive at an Eco-Rating for the facility.

It did not address the activities of the pipeline facility adjacent to the terminal. There is no residential township attached to the unit.

Introduction to Eco-rating

1 Why evaluate performance?

Several research studies have indicated the seriousness of environmental degradation in India – one recent study estimates the cost of degradation to be roughly 10% of GDP[a]. Bulk of the Indian populace, and not just isolated, backward communities, are experiencing these impacts, resulting in a heightened awareness and sensitivity to environmental concerns. Simultaneously, several other key factors have come into play in the last 10–15 years.

- Growing environmental activism. There are currently over 10000 environmental and development oriented NGO's, citizen groups and pressure groups in India (roughly 20 times the figure in 1985)[b]. With a view to further strengthening the environmental movement in the country, the MoEF (Ministry of Environment and Forests) constituted an NGO Cell in 1992.
- The frequency of public interest litigation (PIL) has also risen considerably. Changes in environmental legislation have given individuals, even if unaffected, the power to file legal complaints with relative ease. PIL has effectively spotlighted the link between environmental and business risks.
- Regulatory trends indicate a gradual tightening of emission norms[c] and heightening of corporate accountability for environmental problems. Recent examples being the inclusion of public hearings in the EIA process, the Public Liability Insurance Act (1991) for damages caused by accidents involving hazardous substances, reporting of energy consumption data in annual balance sheets. Enforcement however remains slow and weak (based on unofficial figures, CII estimates[1] compliance level at approximately 45%, for all large, medium and small industrial sectors).

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[a] Green India-2047 , TERI

[b] India: An Emerging Environmental Market A Handbook for Trade & Business Opportunities, Confederation of Indian Industry.

[c] Emission norms ($CO+HC+NO_x$) for petrol cars were lowered from 16.3–30.0g/km (1991) to 11.68–16.76g/km (1996), will be reduced further to 3.69g/km (2000). Similarly, should not have spill over in case of other vehicle categories.

- Globalisation is exposing an increasing number of companies to the more stringent environmental standards of the West e.g. green criteria for products, ISO 14001 certification.
- Shortage of resources such as water, energy and forests is not only impacting ordinary citizens but is also constraining industrial activity. Hence the increasing importance being given to resource conservation measures.
- The size of Indian businesses has been growing rapidly, and so also the number of associated stakeholders/ shareholders. For instance, the share of public (versus private) limited companies in total paid up capital, moved from 40% in 1987–88 to 50% in 1990–91, and further to 70% by 1995–96. This shift has resulted in a broadening of the investor/ lender base, which in turn has created pressures for greater corporate accountability and transparency. Hence, the rise of standardised accounting/ disclosure norms, financial ratings, codes of corporate governance – and hopefully, now environmental performance reporting.

Despite the concern over environmental problems, considerable ambiguity prevails on the subject. Conflicting perspectives are provided by various stakeholder groups e.g. NGO's, local community representatives, industry associations, government bodies. Poor quality and lack of information (highlighted at the outset) further compounds the confusion. Enforcement agencies do not enjoy public credibility, nor have the requisite capability/ resources to play the role of a 'referee'. The fact that the subject is a technical one, further discourages the lay person from seeking out information and arriving at independent conclusions.

As a result, the environmental debate has become a matter of viewpoints, rather than hard facts. People appreciate the significance of the problem, but view it as too subjective/ controversial a topic to be incorporated in mainstream decision-making. A need exists for a tool – an objective and credible performance evaluation system - to address this information gap.

2 International evaluation frameworks

Pressures and trends similar to the above, have resulted in the development of a host of performance evaluation and disclosure frameworks. A classification of these is provided in the box below.

Table 1 Classification and Characteristics of various labelling programs:

	Type of stimulus		Legal status		
Type of program	Positive	Neutral	Negative	Voluntary	Mandatory
Seal of approval (e.g. Green Seal)	✓			✓	
Certifications (e.g. ISO 14001, EMAS*)	✓			✓	
Single attribute cert. (e.g. Energy Star)	✓			✓	
Report card		✓			
Information disclosure (e.g. US EPA fuel economy label)		✓			
Hazard warning (e.g. Pesticides, Ozone)			✓		✓
Environmental Ratings: (ref below)					
(e.g. Proper PROKASIH)	✓	✓	✓		✓
(e.g. CEP*, IRRC*)	✓	✓	✓	✓	✓

[1] Though not mandated by the Govt. these are not strictly voluntary in that the company's consent is not taken for performing a rating. * EMAS: Environmental Management Assessment System; CEP: Council of Economic Priorities; IRRC: Investor Responsibility Research Centre

Source: Adapted from Graedel and B.R.Allenby (1995)

As is apparent from the above table, various evaluation and disclosure schemes have been introduced internationally. However, due to the existence of one or more of the following features, these systems were viewed to be unsuitable for the Indian context:

- Focus on management systems, and not end performance aspects
- Systems based on self-assessments, as against third party evaluations
- Use of publicly accessible data for evaluation
- High level of complexity of assessment framework
- Industry-specific framework (as in case of internal rating programs of corporates)

Consequently, the need was felt for an indigenous rating system that took account of local conditions and stakeholder requirements, in its design and implementation.

3 About Eco-Rating

TERI's Eco-Rating is an indicator of corporate environmental performance at the unit/ facility level. The instrument is directed towards achieving the following objectives:

- Offer a means for corporates to publicise their achievements in the field of environment;
- Enable them to track performance over time, and undertake comparisons across facilities;
- Assist corporates in identifying key gaps, and present/ prioritise these in a manner that even management staff outside the environment function can relate to;
- Facilitate benchmarking of performance against industry best-in-class/ international standards.

The system is applicable to running facilities, and is completely voluntary i.e. the rating is performed and made public with the consent of the corporate. This feature will in the long run, facilitate a shift from "external rule management" to "internal target management".

4 What does the Eco-Rating signify?

The rating is intended to be an indicator of environmental performance, or conversely, an indicator of environmental risk. The term 'environmental risk' can be interpreted in various ways, as is illustrated by the following *'Risk Chain'* - a graphical representation of the dynamics of environmental risk:

Figure 1

System factors→	**Environmental Performance →**	**Impact - 1**	**→ Impact - 2**
(~ISO standards)	(~Legal standards)	(~ EIA's)	
E.g. Air Pollution			
- Production systems	Emission	Ambient	Health of local
- Raw material/Fuel used	- Mix	air quality	population,
- Control equipment	- Concentration		natural habitat
- Oper'l and Managerial aspects	- Load		
- Material storage / handling			

From the above it is apparent that risk can be assessed at various levels viz.

- in terms of final impact, or
- in terms of intermediate impact on the ambient environment, or
- at source (corresponding to 'environmental performance' above), or
- at the system level.

The Eco-Rating system (ERS) focuses at the source and system levels for assessing risk, while also using intermediate impact in select instances. Use of these parameters makes the rating assessment a two-fold one -

a. At the source level, the evaluation indicates environmental performance as per observed and reported levels
b. The system and intermediate aspects on the other hand, indicate the facility's 'confidence' in achieving the observed/ reported levels of performance, on a sustained basis.

5 Rating categories

The rating categories have been developed using the rationale outlined in the previous section, and adopting features of internationally recognised evaluation frameworks such as Proper Prokasih (Indonesia), ISO 14001, Environmental Self Assessment Program (Global Environmental Management Initiative) and Total Quality Environment Management (Council of Great Lakes Industries). In addition, relevant aspects of systems used by large MNC's such as Allied Signal, Nortel, DuPont and Union Carbide have also been incorporated in the system.

Rating categories under ERS are described below.

A: World class performance on environment, health and safety.
B: Pollution control and housekeeping significantly exceed compliance
C: Compliance - high confidence (adequate pollution control equipment, monitoring and control systems in place)
D: Compliance – low confidence i.e. risk of non-compliance (adequate pollution control equipment in place, without requisite monitoring and control systems)
E: Unsatisfactory

6 Scope of Eco-Rating system

The aspects addressed as part` of the rating are as follows:

- *Pollution/ Environmental impacts:* Air, Water, Solid wastes, Hazardous materials/ wastes (including 'clean technology' issues)
- *Resource intensity:* Energy, Water, Raw materials (if environmentally sensitive)
- *Work environment:* In-plant pollution/ exposure aspects (e.g. air, noise, toxic substances)
- *Contingency management systems:* Safety systems, Contingency plans, Functionality
- *Environmental management systems:* Integration with management process (extent of development and efficacy)

7 Collation methodology

Various options are available for collation of scores across rating parameters. Weighted averaging, the most commonly used technique, was discarded in view of the widely disparate criteria being collated and multiple levels of aggregation. Instead, a logic framework has been used, incorporating a combination of performance profiling (refer Table below for illustration) and maxima/ minima conditions.

Table 2 Performance profiling

Rating	Profile condition
A	More than 50% of parameters to be rated A, and none rated C or below
B	More than 50% of parameters to be rated A or B, and none rated D or below
C	More than 50% of parameters to be rated A or B or C, and none rated E
D	Any other combination, but no parameter rated E
E	Any parameter rated E

Note [A similar methodology has been used by Union Carbide in their internal rating program]

Performance profiling as per the above table indicates a general performance level, subject to a minima on parameter level ratings. For instance, a *B* rating would indicate that most parameters are well above compliance (*B*), with none representing risk of non-compliance (*D*). In addition to profiling, maxima/ minima conditions have been used selectively, to emphasise performance on critical rating parameters.

Unlike the weighted average approach, the collation technique described above minimises the likelihood of poor performance on one set of parameters being offset by good performance on another.

Using the example of stack emissions from a cement facility, the following tables (Fig. 2) illustrate how the above methodology enables collation of assessments across various levels of parameters.

Figure 2 Collation for Stack Emission parameter

				Stack Emission (SPM - mg/Nm3)				
	Stack	Legal limits	Data Points*	Mean	Min	Max	Median	Rating**
1	Unit-I Kiln	250	15	169	65	244	159	C
2	U-II Kiln	250	16	137	81	203	135	C
3	U-III Kiln	250	16	89	41	139	90	B
4	U-I Coal mill	150	15	85	27	172	73	B
5	U-II Coal mill	150	16	88	56	144	85	C

*Number of emission readings used for each stack. **[Arrived at after evaluating mean, median, etc. against pre-defined benchmarks.

Section stacks	Rating
Kiln + Raw mill	C
Coal mill	D
Cooler	C
Cement mill	C
......	

Stack Emission
C

8 Rating process

The rating process involves several steps. Once a corporate gives consent to get a facility rated, data collection is initiated through a two-stage process. Preliminary details about the unit are first obtained using a standardised questionnaire format. A site visit is subsequently undertaken as part of which secondary data is collected, primary monitoring is performed (if required) on a sample basis and interviews are conducted with key unit personnel, local regulatory officials and some local residents. The information thus collected is processed using the Eco-Rating model to arrive at a tentative assessment and rating. Clarifications if any are taken from the unit during this period. Subsequently a group of experts (Rating Committee) reviews the assessment to arrive at a final rating. If the corporate gives consent for making the rating public, TERI publicises the same through its internal and external communication channels. Otherwise, the rating is kept confidential by TERI.

9 Eco-Rating versus ISO 14000

ERS is designed to be distinct, yet complementary to the ISO program. It differs from ISO 14001 in the following ways -

- ERS focuses on physical performance indicators for assessment, while also incorporating EMS related aspects.
- It uses a gradient of performance levels, which recognises several stages in the 'green' evolution of a corporate (as against a 'yes / no' certification), and consequently,
    - facilitates participation by a wider cross-section of companies, including lower end performers; and
    - enables the tool to serve as a trend indicator.

The complementarity between ERS and the ISO 14001 programs is two-fold.

- Companies, which have not acquired an ISO certification, can use the ERS to work towards getting one.
- On the other hand, companies that have been certified can use it to compare performance across facilities, or against benchmarks. Once a certification is obtained, a common sentiment is "What next...?". The benchmarking incorporated in the rating model, offers a useful follow through to a certification exercise, and can help keep the performance graph pointed upwards.

Cross facility/ company comparisons can even be used in industrial complexes where common facilities (common effluent treatment plants, emergency services) are used. Greater transparency and performance monitoring could increase accountability (thereby addressing the 'free-rider'[a] problem), and improve coordination activities.

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[a] Usually observed in CETP (common effluent treatment plant) operations, where some facilities release effluents with higher pollution loads than the designed capacity of the plant. This may be offset by better quality effluent released by other more responsible facilities sharing the same CETP. The first set of facilities thus become 'free-riders'.

Executive summary

Rating profile

Operations and maintenance	**A**
Tanks and Tank farm	A
Pipelines	A
Pumps and valves	A
Tank truck gantry	A
Tank trolleys	A
Lube oil storage and furfural doping	A
Operational control	A
Pollution and Resource intensity	**A**
Ambient air quality	A
Water	A
Noise	A
Resource intensity	B
Work environment	**A**
Noise exposure	A
Air quality	A
Housekeeping	A
Confidence factors	A
Contingency management systems	**B**
Past track record	A
Contingency plan	B
Contingency prevention/management systems	A
Efficacy of CMP	A
Environmental management systems	**A**
Past track record	A
Policy and planning	B
Implementation	A

Measurement and evaluation.. A
External stakeholder investment.. B

Operations and maintenance

+ Construction of tanks and their layout in the tank farm area is as per requirements and ensures adequate safety during normal operations
+ Dyke wall, fire-wall and circumferential drains are well constructed
– Display of tank information, however, needs to be as per OISD guidelines
+ Tank health in terms of foundation condition, wall thickness, pipeline support etc is well maintained
+ Adequate safety provisions such as expansion lines for vapor release provided
+ Properly maintained pipelines, pumps/valves with minimal leakages
+ Fully automated tanker loading operations with provisions that ensure minimum product wastage and high safety
+ Well defined systems in place for the selection of tank trucks vis a vis safety and regulatory requirements and TT operations
+ Excellent operational control during the receipt and transfer of products in tanks with adequate controls to check overflows
+ Maintenance and calibration procedures are well defined

Pollution and resource intensity

+ The air quality levels of SPM, NO_x, SO_2 were well within limits as per the consent requirements and monitoring is being done by external agencies twice in a year
+ Monitoring of industry specific pollutant viz. hydrocarbons was done regularly at different locations and the results were satisfactory
+ Adequate afforestation done around the plant premises, while observing requisite safety requirements
+ No wastewater was discharged from the plant and the quality of wastewater treated by the oil water separator was satisfactory. Monitoring is being done 2–3 times every year
+ Ground water quality is monitored once in a year
– The noise levels exceed limits slightly at locations like the DG set room, fire water pump house and the product pump house.
– Scope for improving systems to track energy and water consumption

Work environment

+ Worker noise exposure levels are within limits
+ Air quality levels are satisfactory
+ General housekeeping activities are well organised and regularly followed with minimal spills
+ Coverage of safety awareness for all target groups adequate
- Scope for increasing speed of access to medical facilities and personnel in case of emergency.

Contingency management systems

+ No incidents have been reported in the past 2 years. Incident reporting and record keeping is adequate
- Damage criteria for Risk analysis based on 100% fatalities for all people exposed to direct contact with flames as compared to first degree burns criteria for general population adopted in the earlier report
- The contingency plan for the facility exists but some delay in its update occurred after an increase in the storage capacity of the unit.
+ Fire and safety drills involving plant personnel carried out regularly with proper recording and follow-up procedures
+ Fire fighting infrastructure provided and maintained adequately. Well equipped and automated control room for handling emergencies
+ Efficient security systems in place with adequate control on movement of personnel through issuance and checking of photo identity cards
+ Coverage of safety awareness for all target groups adequate
+ Regular system in place for different types of audits and follow up of audit recommendations

Environmental management system (EMS)

– There is no environmental policy at the facility level
+ Adequate provision of resources - financial and manpower - for environmental activities.
+ Existence of clear responsibility structure and direct involvement of unit head in addressing environmental concerns

General observations (not considered for rating purposes)

Procedures associated with tank trolley operations are detailed and very comprehensive. The facility may wish to consider the following suggestions to further increase their efficacy:

- The safety index calculated monthly, could include sample checking of condition of TT
- The 'Green Card' issued to TT's could include requirement to carry pollution under control certificate
- The valve shut-off lever is located next to the fuel tank. Design changes could be considered to shift it to a safer location on the truck.

There is scope for explicitly defining the contingency management outside the facility premises, associated with oil spills / fires in the event of a tank trolley (TT) accident. Greater clarity is required on liabilities arising out of such accidents.

Assessment report

1 General information

Name of the unit : Jaipur Terminal, Indian Oil Corporation

Address : Sitapur Industrial Area, Sanganer, Jaipur – 303 905
Tel: 0141 – 580 112, 580 269

Contact person : Mr. R. Sayal, Terminal Manager

Year of installation : Commissioned in March, 1996 with HSD and SKO facilities. MS facilities commissioned in April 1997, and lubricants business from July 1997.

Storage capacity :
HSD - 54000 kl
SKO - 13500 kl
MS - 36500 kl
Lubricants - 150 kl (10000 barrels + 5000 packs)

Product throughput (1999–2000) :
HSD - 764250 kl
SKO - 120676 kl
MS - 30170 kl

Expansion plans : None

Outsourced / Off-site processes : None

Staff strength :
Officers - 13
Blue Collar Workmen - 30
White Collar Workmen - 04
Total - 47

Out of these, one officer and three blue-collar workmen work in A Shift (0600–1400), B Shift (1400–2200) and C Shift (2200–0600). The remaining 35 employees work in general shifts (0800–1700 from Monday to Friday and 0800–1400 hrs on Saturday).

No casual labour has been employed by the Terminal. Certain activities like housekeeping, gardening, haulage and security have been given on contract to various parties. On an average nearly 25 contract labour work in the Terminal during the general shift and 30 security guards work in A, B and C shifts put together.

1.1 Location of storage terminal

The facility is located 20 kilometres on NH 12 from Jaipur city, in Sanganer, Sitapur Industrial area, in Rajasthan state. The nearest railway station is in Jaipur, while the nearest airport is 6 kilometres away in Sanganer.

The depot receives petroleum products by pipeline from the Kandla Bhatinda pipeline, stores these in tanks and distributes these products by pipelines and road tankers to different consumers. The terminal is the third tap off point (after Sidhpur and Jodhpur) on the Kandla Bhatinda pipeline – a 1443 kilometres long white oil pipeline from Kandla on the Western coast to Bhatinda in Punjab.

Areas covered by marketing include Jaipur, Sikar, Jhunjunu, Churu, Tonk and Hanumangarh. The installation is surrounded by oil depots of BPCL and HPCL in addition to some villages and the main railway line running closeby. On the Western side are a cremation ground and the industrial site of RICCO. It may be mentioned, IOCL also operates a depot in Jaipur city.

1.2 Brief description of terminal

The terminal is fully automated for monitoring and controlling plant operations - the first such installation in the Indian oil industry. All operations, including receipt, handling and delivery of petroleum products are fully automated with various safety interlocks to minimise wastage. The products handled at the installation include Motor Spirit (MS), High Speed Diesel (HSD), Superior

Kerosene Oil (SKO) and lubes. Details of facilities available at the terminal are provided in Annex 1.

Operations at the terminal broadly include the following:

- Storage (Tank farm)
- Pumping facilities
- Loading and Despatch (Gantry operations, Pipelines)
- Lube oil storage and despatch

Storage facilities: The terminal has 11 main storage tanks with varying capacity located in bunded enclosures as per the Petroleum Act requirements. Tank integrity is maintained through inspection, which is carried out (frequency depending upon the service) as per OISD standards. There are bunded sections and all are concrete filled.

Pumping facilities: The installation has several pumps (approx. 10), which are used for pumping products to BPCL and HPCL, and for tank lorry filling. These pumps vary in capacity from 238 M3/hr to 415 M3/hr. The pumps used are centrifugal type pumps and are fitted with mechanical seals. All pumps are dedicated to a particular service.

Loading and despatch facilities: Road tanker loading facilities are provided in the terminal. No rail tanker loading facilities exist, nor are envisaged. The details of the loading facilities provided at the installation are as follows:

TLF Gantry

No. of Bays:	Thirty (30)
Loading facility at Gantry:	
HSD	18 Bays
MS	3 Bays
SKO	6 Bays
MS + HSD	3 Bays

Movement of trucks is tightly controlled, with photo ID cards for all truck drivers and crew members, security checks of all personnel entering the facility and automated systems for filling of tank trucks. Movement of trucks is approximately 100 per day. In addition, product is despatched by pipelines directly to the oil depots of HPCL and BPCL, located in the vicinity of the terminal.

Lube oil storage and despatch: Operations relating to lube oil storage and despatch are conducted completely independent of the white oil products. A separate yard provides for storage of lube products in barrels and packs – delivered by road. Stocks are delivered to dealers/ buyers at the yard, with manual loading on the customer vehicles.

Miscellaneous facilities: Other facilities of the installations consist of administrative office, parking shed, sales & distribution block, workshop, computer control room, transformer / meter room, stores etc.

1.3 Certifications and awards

Jaipur terminal has been certified for ISO 9002 (Quality System) in 2000 by KPMG Quality Registrars. The terminal has the following recognitions to its credit:

i) 1998: Commendation certificate under the "Rajiv Gandhi National Quality Award" in the service sector category.

ii) 1997–98: Award for best performance in maintenance amongst all terminals of IOC

1.4 General

There is no staff colony near the terminal. Staff members reside in the colony in Jaipur city.

Operations and maintenance

2.1 Tanks and tank farm

The terminal is located reasonably away from any densely populated area, though the industrial area lies adjacent on the North-west side of the terminal. The licensed and unlicensed areas are well designated. The plant layout, layout of tanks and their construction is as per the OISD recommendations/ requirements. Tank to tank interdistances are adequate for efficient operations, maintenance, fire control and fire fighting (refer Annexure 2 for the distances between the different facilities at the terminal location). All storage tanks are fully welded tanks; there are no riveted tanks on the premises. All tanks are at atmospheric pressure – there are no pressurised storage tanks. Dyke wall/ bund wall of suitable height is provided around the tanks. Fire walls of proper height are also provided around individual tanks. The arrangement of drains and floor slope is adequate to collect spillages (if any), and route them to the slop oil tank. Local and auto displays for product level in the tank and temperature, have been provided adequately and are calibrated regularly. The tank health (in terms of corrosion in the tank, undulations in tank bottom, support conditions of the inlet and outlet lines, paint condition etc) was sound because of regular maintenance.

Extensive maintenance procedures have been laid down and are followed. The terminal has the highest Maintenance & Inspection Index amongst all the depots and terminals of IOCL in the country. Earthing strips, vents, expansion lines, tank ladder, walkways and other measures ensure adequate safety. Signs of product spills in general were not observed. Being a relatively new facility, tank cleaning operations have not been done except once during a product change. The condition of the rim seal is being checked regularly and is in good condition. However secondary seal could additionally be provided to check vapor losses. Display of tank information like tank number, product details etc has also been done at one location only, though ideally this should be at three locations, each 120° apart.
[Rank : A]

2.2 Pipelines

The general condition of the pipelines and the supports was good. Neither leakages nor any signs of land contamination were observed in any of the pipeline sections. Maintenance and inspection procedures for pipelines were well defined and followed adequately. The painted surface and wrapping coating for the underground section was maintained adequately with proper colour coding for all of the pipelines. All segments of the pipelines were easily accessible for maintenance with regular grass cutting at critical locations.
[Rank : A]

2.3 Tank trolleys (TTs)

All contracted TT's are required to observe well-defined procedures with respect to contingency requirements including provisions for spark arrestor and fire extinguishers. Display of information on product type and contact information for potential emergency situations is also adequate. Requisite direction and support is given to the TT drivers to ensure a proper operational control. Procedures for maintenance of tank trolleys, contingency equipments etc are adequate. Safety checks are carried out regularly.
[Rank : A]

2.4 Tank truck (TT) gantry

The provisions in the tank truck gantry operations ensure high operational safety and minimise chances of spillage during regular operations. The operations in the TT gantry are fully automated with adequate controls from the control room. Quick shut off valves have been provided in the loading arms that ensure cut-off of supply from the main header as soon as the earthing arrangements are out of place. Besides the vacuum release valves with chain and lever arrangement ensure a minimal accumulation of volatile fumes and consequential effects. Adequate contingency arrangements have been made in the gantry area with provisions for proper earthing, arrest of frictional sparks and defined colour coding for the pipelines. The infrequent use of the tank lorry decantation facility highlights low rate of operational failures. Its operation is also managed cleanly ensuring minimum wastage of products. Drains for collection of spills or water used for floor washing have not been provided in the periphery of the area. However, the general housekeeping in the tank truck gantry area is good with no signs of any floor contamination.
[Rank : A]

2.5 Pumps and valves

The health of pumps and valves in the unit was good with proper maintenance and record keeping practices like history cards. The level of vibrations and condition of seals, glands and filters, as highlighted by the other audits, reflects the sound health of the system. All types of valves- hammerblind, drain, control and automated-were in proper position, leak free state and calibrated regularly.
[Rank : A]

2.6 Lube oil storage and furfural doping

The storage of barrels in the lube oil storage area was well confined and organised properly. This area however needs to be provided with some fire extinguishers indoors. Similarly the fire loop should also be preferably extended towards the lube oil storage area to have additional and more reliable water provision for fire fighting. Smoke alarms and communication with control room could also be provided. Separate storage area has been provided for furfural. Safety provisions like the safety shower and PPEs in this area need better upkeep.
[Rank : A]

2.7 Operational control during receipt and transfer of product

The procedures to control the product quality and losses during the receipt and transfer of product are well defined. Samples are drawn from different levels in the tank during the product receipt in presence of officials from both the pipeline as well as the storage terminal division. Adequate provisions are also provided to check overflows during product intake into tanks from the pipeline. Stringent addherence to these practices has ensured minimal wastages and absence of incidents like spills/ overflows in the past.
[Rank : A]

Salient observations made as part of the external safety audit conducted for the terminal by the OISD are given as Annexure 3.

Operations and Maintenance: A

Pollution and resource intensity

3.1 Pollution: Air

3.1.1 Stack emissions

The unit does not have any processing activity and there are no specific stack emission guidelines prescribed by the Rajasthan State Pollution Control Board (RSPCB). The unit does have three stacks attached to the Diesel Generator (DG) set, which however, is operated only for daily testing (5–6 minutes) and during power failures (roughly 3–5 times a month, of which only 1–2 times for over 4 hours). The minimum height prescribed by RSPCB for the DG set stacks is 11 m, and the facility officials informed that the height of the stacks above the ground level is about the same. Since there are no regular stack emissions, this parameter has not been considered for rating.

3.1.2 Ambient air quality (AAQ)

AAQ level

The consents to operate (initial and revised) granted by the RSPCB specify only the ambient air quality standards for SPM, SO_2, NO_x, and CO (Annexure- 4, 5). AAQ monitoring at the IOCL facility is being done by external agencies. The sampling duration is for 8 hours. The air quality levels of SPM, Nox, SO2 were well within limits as per the consent requirements. Monitoring for CO is not being carried out. This however, is not seen to be a critical pollutant considering the fact that there are no major emission sources for the same. AAQ monitoring results are given as per Annexure- 6.
[Rank: A]

Monitoring and testing facilities arrangement

The arrangement for monitoring with the external agencies also is adequate with regular monitoring done twice a year.
[Rank: A]

Monitoring of additional pollutants

Monitoring of ambient levels of industry specific pollutant viz hydrocarbons is done regularly (once a month) at different locations in the terminal. The

terminal is equipped with Gastec air sampler and ampoules for monitoring of ambient hydrocarbon content in and around the terminal. The monthly results from the period May 1999 – September 2000 as per records maintained by the terminal are satisfactory. In addition, actual test/ measurement carried out during the site visit in September 2000, confirmed the result to be satisfactory.
[Rank: A]

Quality of measurement and record keeping

Relevant records are maintained for monitoring done by the external agency and in-house personnel.
[Rank: A]

Afforestation

Out of the total area of 105 acres, approximately 65 acres (63%) is under green belt and well maintained.
[Rank: A]

Air: A

3.2 Pollution: Water

Plant drainage layout

The layout of plant drainage has been prepared and is available for handling emergencies.
[Rank: A]

Waste water collection

The wastewater generated in the plant is oil water mixture only. There is a network of stormwater drains and oily waste sewer that collects the wastewater generated from different sources/areas in the terminal. Storm water drains located inside the dyke wall are connected to the main pipeline leading to the treatment facility, through oil water separator. Along the main pipeline from tank farm to treatment facility, various sumps are located, which act as oil water separators and help in salvaging oil. The operational performance of wastewater collection system was satisfactory.
[Rank: A]

Treatment and disposal

The effluent generated in the terminal is only oil water mixture. An effluent treatment plant (ETP), which is an efficient oil water separator (OWS), is available for treatment of this oil water mixture. The OWS is of tilted plate inceptor type. The water from the outlet of the OWS is tested for oil content before it is discharged into the storm water drains. The water thus discharged is circulated in the storm water drains and is not discharged out of the terminal premises. The oil separated from water in the above process is collected in an underground slop oil tank (20 kl capacity) and is returned back to one of the HSD tanks after ascertaining its quality from the laboratory.

The provision of oil water separator was adequate for the nature of waste generated and handled. Its functioning was found to be satisfactory and the monitored values of the treated wastewater are well within the prescribed range for all parameters, as per the consent requirements. Annexure-7, 8 are the initial and revised consent conditions to operate.

[Rank: A]

Water effluent discharge

No wastewater is discharged from the plant and the quality of wastewater treated by the oil water separator was satisfactory. The results of analysis of the treated wastewater are attached as Annexure- 9.

[Rank: A]

Ground water quality

Ground water quality is monitored once in a year. The monitoring is being done by an external agency. No significant impact on ground quality is observed due to the terminal operations. The results of the latest raw water sample analysis are given as Annexure-10.

[Rank: A]

Monitoring and testing facilities arrangement

Monitoring is being done 2–3 times every year by an external agency for pH, TSS, COD, BOD and oil and grease. The arrangement for monitoring with the external agencies also is adequate with regular monitoring being done. The terminal has a well-equipped lab for monitoring the quality of products, the unit could consider having in-house test equipment/ facilities for wastewater quality monitoring.

[Rank: A]

Record keeping

The frequency of monitoring, quality of measurement and record keeping are adequate. However necessary clarifications need to be obtained from the RSPCB on the limits for total suspended solids as mentioned in the consent conditions.
[Rank: A]

Water: A

3.3 Pollution: Noise

Monitoring and testing facilities/arrangement

The major sources of noise in the terminal are the rotary equipment like diesel generators, fire engines, product pumps and pressurization units. Noise levels are monitored at various locations in the terminal through vibration monitoring which is done once in 6 months through an external agency.
[Rank: A]

Noise levels

The noise levels at the peripheral road near the boundary and the truck loading facility (TLF) plant are in the range of 52–69 dB and thus below the daytime industrial area standard of 75 dB as prescribed by CPCB.
[Rank: B]

Noise: A

3.4 Pollution: Solid waste

The terminal does not have any significant solid waste generation. Only a small quantity of solid waste is generated - sludge from the sludge disposal pits and cardboard cartoons in the lube oil storage area - which is being managed properly. Also, since the terminal has no processing activities, no waste of hazardous nature are generated as a by-product of the activities. Thus, solid waste has not been considered for rating.

3.5 Resource intensity

Given the nature of operations at the terminal, the major resources consumed are energy and water. The range of monthly consumption of various resources based on actuals in the last 6 months is as follows:
Electrical energy : 124020 kWh to 170010 kWh
Fresh water (service purposes) : 1800 kl to 2400 kl

Diesel: 1600 ltr to 1800 ltr
The borewell water available in the terminal is used for service purposes like fire fighting, gardening etc.

Energy and water meters and photocensors for putting on/off the yard lighting have been installed. However, due to the absence of proper systems to track the energy and water consumption, opportunities have not been explored for decreasing the resource consumption levels per unit of production. The resource consumption levels are constant over the period of time.

Resource Intensity: B

Pollution & Resource intensity: A

Work environment

4.1 Noise exposure

The nature of operations is such that the worker noise exposure is minimal. Areas with probability of high worker exposure levels include the DG set room, firewater pump house and product transfer pump house. However since operations in the DG set room are intermittent, only during a power failure and unmanned in the firewater and product transfer pump house the likeliness of continuous worker exposure is low. Levels of worker noise exposure are within the OSHA limits. Adequate safeguards like ear plugs/ earmuffs have been provided for workers at locations where the noise levels are usually high such as the DG room. It however needs to be ensured that the workers use these safeguards regularly. Annexure 11 provides details of noise levels in the DG set room, firewater pump house and product transfer pump house.

[Rank : A]

4.2 Air Quality

With the automation in operations and no major cleaning operations(like tank cleaning), there is hardly any exposure to VOCs. Safegaurds have been provided, however, where ever required.

[Rank : A]

4.3 Housekeeping

Housekeeping practices in the unit are generally well organised. Signs of land contamination were minimal implying generally clean operations and regular housekeeping. The surface drains for wastewater and rainwater were well lined and clean without sign of any choking indicating that there were no overflows. Grass cutting is carried out regularly to enable better maintenance in case of pipelines and as a part of safety requirements in the tank farm area. Housekeeping schedule is defined well and its assessment is also a part of many audits. Facilities for ventilation and illumination in entire work area were also adequate. Comprehensive Health Analysis and Reinforcement (Annexure 12) supports these observations.

[Rank : A]

.4 Confidence factors

Monitoring of the in-plant conditions- ambient air quality, noise levels covers all required aspects and is done at desired frequency. Adequate arrangements have been made for monitoring these by tying up with external agencies. Posters and notices advising safety measures have been displayed adequately. Safety awareness programmes are also carried out regularly and all target groups specially the TT drivers are covered comprehensively vis-à-vis the contingency requirements and their role.

Employees can access medical facilities at designated hospitals in the city, on an 'as and when' basis. Routine medical checks are not undertaken nor are considered necessary given the absence of exposure to any health hazard on an on-going basis.

There is scope for increasing the primary medical facilities in case of emergency. While requisite first aid material is available at the facility, a few minor gaps were observed in the speed of access to the same. Other life saving equipment like automatic oxygen dispenser, air breathing apparatus, SOS cans, snake bite serum, fire gel, blankets etc. have nevertheless also been provided at the facility. A vehicle is available for transporting injured personnel to hospitals in the city (15-20 kms away). For speedier access, the unit could consider instituting formal arrangements with readily accessible medical facilities/ medical personnel in the vicinity of the facility.

[Rank : A]

Work Environment: A

Contingency management systems

5.1 Past track record

The facility has an incident free track record. No incidents have been reported in the past 2 years. The procedure for incident recording and reporting is adequate. [Rank: A]

5.2 Contingency/ Disaster management plan

5.2.1 Updation and approval of CMP/DMP

The contingency plan for the facility exists but some delay occurred in its update, after an increase in the storage capacity of the unit. However, an updated CMP is available now (refer Annexure 13). The updated DMP has been accepted by the Deputy Chief Inspector, Factories and Boilers and a formal approval is awaited. A copy has been submitted to the District Magistrate's office for vetting as well.
[Rank: B]

5.2.2 Scope

Risk analysis

Hazard identification. The risk analysis report identifies the significant hazards that are likely in such a facility and analyses an appropriate set of incidents[a]. The study covers major probable accident scenarios, which include poolfire and tank fire. The study covers major probable accident scenarios which include poolfire and tank fire due to release from HSD, SKO, and MS tanks; vapour cloud explosion (VCE) due to release from MS storage tank; poolfire and VCE due to release from MS hose rupture; and poolfire due to release from HSD/ SKO/ MS pumps.

Methodology. In the consequence analysis, a number of calculation models are used to estimate the physical effects of an accident and to predict the damage of the effects. The basic physical effect models consist of source strength parameters and consequential effects (such as intensity of heat radiation, energy of vapour cloud explosions, and concentration of gaseous material due to dispersion). The damage criteria gives the relation between extent of the physical effects (exposure) and the percentage of people that will be killed or injured due to those effects. In the earlier Risk Analysis report (prepared by EIL in 1995), the critical damage criteria was taken as the effect of fire on people outside that manifests itself in the form of thermal radiation. However, in the Risk Analysis report (dated July 1999 prepared by Techno Safe Consultants), damage criteria has been diluted and the new criteria is in terms of 100% lethality for all people exposed to direct contact with flames. The effect of lesser incident heat radiation intensity such as first-degree burns is not considered while calculating the final hazard distance. The first-degree burns criteria is desirable in order to find out the effects on the general population exposed to this intensity level. Also, vulnerable zones are not depicted on the site plan/layout plan in the revised report.

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[a] An appropriate set of incidents is the minimum number of incidents needed to satisfy the requirements of the study and adequately represent the spectrum of incidents enumerated.

Risk reduction recommendations. Adequate recommendations have been provided in the Risk Analysis report in terms of cooling of adjacent tanks (sprinkler system), fixed foam system, safety awareness campaigns, and state of preparedness of emergency.

Disaster management plan

The report covers issues such as fire fighting facilities, water and foam system, warning systems and an action plan. In the combined DMP/ Risk analysis report, important information such as contact details of key plant personnel/ external liaison agencies/ mutual aid scheme has been provided. In addition, explicit emergency classification and handling procedures have also been dealt with. The infrastructure to handle emergencies as defined in DMP is adequate in terms of firewater, foam storage and delivery systems and communication/alarm facilities.
[Rank : A]

Contingency Plan: B

5.3 Contingency prevention/management systems

5.3.1 Fire fighting capabilities

Adequate fire fighting infrastructure is provided at the site and maintained satisfactorily. Annexures 14, 15 provide the layout of the fire water hydrants in the terminal and fire water calculations for the terminal respectively. Details of other infrastructure for fire fighting is as per Annex 16. The fire organisation

chart for the unit is well defined and adequately displayed. Automated fire alarm facilities and fire fighting system for immediate response in emergencies are available. In case of emergency, the fire engines get started as soon as there is a pressure drop in the system to facilitate effective fire fighting. Regular maintenance of the fire-fighting infrastructure is carried out and records maintained. The health of the infrastructure is satisfactory as borne out by various audits/drills. The water storage capacity in-house is adequate as per firewater requirement calculations. Arrangements have also been made for external help like additional water requirement in case of emergency. Requisite water pressure (7 Kg/cm2) at the remotest point in the fire water network is maintained and in case of fall in pressure, the jockey pump gets activated automatically. There are 5 fire engines and 2 jockey pumps to facilitate pressurisation of hydrant network. Sprinkler rings around product tanks, foam pourers on product tanks, fixed foam installation, and various portable fire fighting equipments exist in the terminal as per OISD guidelines.
[Rank: A]

5.3.2 Communication systems

Infrastructure exists for effective communication between the control room, site and the emergency control centre, comprising of wireless sets and phones. In addition, computerised display for information also exists. Sirens are also provided at strategic locations.
[Rank: A]

5.3.3 Security systems

An efficient security system is in place with adequate control on movement of personnel, exercised through issuance and regular checking of photo identity cards. Photo identity cards are renewed every quarter. Procedure for issuance of an ID card includes a police verification check – records of which are maintained at the facility. The tank truck entry system is computerised with a time bound entry system through magnetic card controlled barrier gates that control the movement of individual tank trucks inside the terminal. Annexure 17 is the tank truck safety checklist and format for temporary gate pass. The TT checklist is completed for random checks done by the IOC staff of the TLF shed. It is also completed at the time of renewal of the green card (half-yearly) for the TT personnel. Watch towers are also provided along the boundary wall, and regular patrolling is done by security personnel for the entire facility.
[Rank: A]

Contingency Prevention/Management systems: A

5.4 Efficacy of contingency management plan(CMP)

Fire and safety drills involving plant personnel are carried out regularly with proper recording and follow-up procedures. The terminal performs mock fire drills every month. Format for fire drill and its report are attached as per Annexure 18. Half-yearly safety audits from controlling offices like state office in Jaipur, regional office in Delhi and head office in Mumbai are also carried out. Details of the mock drill carried out by the OISD team as a part of the external audit is as per Annexure 19. CMP testing involving external agencies is regular with such drills carried out every year. Newspaper clipping for the fire drill involving external agencies is as per Annexure 20. Recording is done adequately for the agencies involved and their response times, efficiency of fire extinguishers, drawbacks and future action plan. Copy of the latest summary report of Emergency Response Drill conducted in April'2000 is as per Annexure 21.

Training in fire fighting, safety and first aid is provided to all employees and tank truck drivers regularly. The various operations in the terminal are fully automated and monitored from the centralised control room. Moreover adequate security measures are taken during regular operations including issuance of hot work permits (Annexure 22) to ensure minimal chances of contingencies. Contact details for handling emergency are displayed adequately.

Regular system is in place for conducting different types of audits/inspections and undertaking rigorous follow up of audit recommendations. Some of the audits/inspections undertaken are external audit by OISD, electrical safety audit, internal safety audits, inspection report on safety and fire protection, Quality control index and Maintenance and Inspection index. The current status of implementation of audits is as per Annexure 23.

[Rank: A]

Contingency management systems: B

Environmental management systems

6.1 Past track record

6.1.1 Record of notices/ penalties/charges

None
[Rank: A]

6.1.2 Record of public complaints/litigations

None
[Rank: A]

6.1.3 Availability of approvals/permits

Requisite approvals are in place. Refer Annexure 24 for detailed listing of statutory approvals with renewal dates. All approvals and renewals are up to date with the exception of the following issues which remain outstanding:

- Formal vetting and approval of the Disaster Management Plan by the Chief Inspector Factories and Boilers and the District Magistrate's office.
- In June 2000 the facility received a letter from Rajasthan Pollution Control Board querying on the availability of a Hazardous Waste Management Authorisation. In Sept 2000, the facility has written seeking a waiver of this requirement, given the negligible hazardous waste generated from the facility's operations. The RSPCB has verbally indicated approval of the exemption, however a written confirmation is awaited.

[Rank: B]

6.1.4 Regulatory reporting

The reporting requirements for the facility are minimal. The annual environmental statement is nevertheless being submitted on a regular basis as per regulatory requirements.
[Rank: A]

Past track record: A

6.2 Policy and planning

6.2.1 Policy

The facility does not have a separate environmental policy. Elements relating to the environment have however been incorporated in the Quality policy. Moreover, at a corporate level, IOC has an environment policy encompassing all the operations of the company.
[Rank: C]

6.2.2 Planning

The environmental risk aspects closely overlap other operational risk aspects for which requisite identification and assessment systems are in place. Regulatory and other industry requirements are coordinated from the corporate and regional offices, which send out intimations of regulatory changes from time to time. The facility has a system of target setting. These include aspects such as tree plantation, accident rate, rejection rates for product samples and wastage. These are monitored as part of routine operations.
[Rank: B, A, B]

Policy and planning: B

6.3 Implementation

6.3.1 Allocation of financial resources

There is no separate budget for environmental expenditures. However provision for environment protection activities like tree plantation, maintenance of ETP, testing of air and water quality and other capital expenditure jobs , has been made under various operational heads like maintenance, haulage, fuel and electricity etc. The Terminal Manager also has discretionary powers for reappropriation of budget allocation of funds for environmental activities. Total budget for all the activities of the Terminal for the financial year 2000–2001 is Rs.14 crores.
[Rank: A]

6.3.2 Allocation of human resources

The personnel responsible for environmental functions have dual responsibility with operational functions. Responsibility structure for environmental cell at the terminal is as follows:

Chief Coordinator [Terminal Manager]. Is the overall in-charge of the environment cell and is responsible for providing resources for environment budget and also approves the activities.

Convenor [Dy.Manager (Lab.)]. Is responsible for monitoring the various activities in the environment cell on a day to day basis.

Other members of cell include:
Maintenance Officer. Is responsible for carrying developmental activities of the cell as per the requirement and suggestions of the environment cell.

Control Room Officer. Is responsible for ensuring conformance to stipulated environment protection guidelines during day to day operations like control of spillage, operation of ETP, etc.

Foreman (M&R). Responsible for assisting the Maintenance Officer in activities of the cell.

Foreman (Control Room). Responsible for helping the Control Room Officer in disposal of his responsibilities.

Chief Coordinator. (also the unit head) reports to the Sr. Manager S&EP at the Regional Office (New Delhi), which in turn reports to the Dy.General Manager S&EP at the Head Office (Mumbai).
[Rank: A]

6.3.3 Awareness/ training and motivation programs

Training is conducted for safety and environment aspects on a periodic basis. For TT crew, security personnel and contract labour training sessions of about an hour each, are held on a quarterly basis. Training register include names of the participants to ensure proper coverage.
Dates for some of the programs held in the last 2–3 years are as follows:

- TT crew: 12.07.2000, 11.04.2000, 08.10.99, 09.04.99, 14.07.98, 10.06.98, 18.05.98
  Participants per session - 14–15
- Contract labour: 14.07.2000, 15.04.2000, 16.06.98, 18.04.98, 17.01.98
  Participants per session – 5–10
- Security personnel: 12.07.2000, 10.04.2000, 14.09.99, 08.09.99, 13.02.99

Participants per session – 14–15

For the corporation employees training records are maintained at an individual level (introduced since July '98 onwards as part of ISO 9002). At the executive level, personnel are sent for external training roughly twice a year; in addition training is conducted internally as well.

Suggestion and award schemes are in place at the corporate level. Employees are free to submit suggestions as per a standard format. These are screened at a corporate level by various committees. The originator of the best suggestion for the year (at a corporate level) wins a cash award.
[Rank: B]

6.3.4 Communication and reporting (Internal)

Internal MIS focuses on safety aspects. Reporting includes the following:

- Self safety audit report (Monthly) - Sent to the Regional State Office
- Fire drill report (Monthly) – Sent to the State Office
- Emergency response drill report (Yearly) – Sent to the State Office
- Accident report or Form 29 (Monthly) – Sent to corporate office

These are being sent regularly. The environmental data is being reviewed by the unit head and is not forwarded to the corporate office. This is viewed to be acceptable given the nature of operations at the facility.
[Rank: A]

6.3.5 Operational controls / Line accountability

Given the nature of operations at the facility, environmental considerations are largely overlapping with operational aspects. There is therefore limited scope for separate addressal of environmental aspects in operational control procedures. This factor has accordingly not been considered for rating.

Since the facility head is the Chief Coordinator for the environmental function, direct line accountability is ensured for the environmental aspects associated with the facility. Accordingly, regular follow up is undertaken for all environmental aspects by the facility head.
[Rank: A]

Implementation: A

6.4 Measurement and evaluation

6.4.1 Measuring and monitoring

Monitoring of environmental aspects such as noise, ambient air quality and groundwater is being conducted satisfactorily. Tracking systems for consumption of energy and water could however be improved.
[Rank: B]

6.4.2 Records maintenance

Level of general records maintenance - internal papers, correspondence, legal permits and so on - reasonably good
[Rank: B]

6.4.3 Environmental audits

The facility is audited annually by officials from the Rajasthan Pollution Control Board. The last exercise was conducted in March 2000. No observations were made or are outstanding as on date. In addition various safety audits are conducted on a periodic basis, which are reviewed at the unit and regional office levels. These include an external safety audit that is conducted by the Dy.General Manager S&EP from the corporate office.
[Rank: A]

6.4.4 External recognition/ certification/ awards

The facility has won several recognitions for its high quality of operations and maintenance e.g. ISO 9002 certification, special commendation under the Rajiv Gandhi National Quality Award.

These aspects are closely linked to environmental performance, and therefore indirectly reflect upon the environmental orientation of the facility as well. The facility is also planning to go in for an ISO 14001 certification in 2001, and is working towards the same.

Measurement and evaluation: A

6.5 External stakeholder investment

6.5.1 Local community

There is no population residing in the immediate vicinity of the facility. The facility nevertheless organises welfare activities from time to time. These include,

- A blood donation camp in 1998

- Distribution of blankets among local hospitals, on an annual basis
- Provision of drinking water facility to Jaipur schools at a cost of Rs.2.5 lac, during a period of water shortage
- This year lent 30 tankers of 20 KL each for water transportation, to state government for 3 months; these were operated company cost.
  [Rank:B]

6.5.2 *Government/ regulatory agencies*

There is no major concern outstanding, with the local regulatory bodies. Requisite coordination and follow-up is initiated whenever required.
[Rank: A]

6.5.3 *Suppliers/Contractors/ Customers etc.*

As indicated by the training programs, the unit management invests substantial effort to ensure adoption of safe practices and maintenance procedures by TT contractors, drivers, crewmembers, security personnel and contract labour.

6.5.4 *General comment on EMS*

Given the nature of operations at the facility, environmental aspects closely overlap with operational and safety aspects. Hence these are mostly addressed as part of the routine procedures. Nevertheless, getting an ISO 14001 certification- as planned by the facility - would help address some of the gaps that remain, while making addressal of environmental issues more rigorous.

External stakeholder investment: B

Environmental management systems: A

Annexures

Facility Details **Annexure 1**

Indian Oil Corporation Limited
Jaipur Terminal
AN ISO 9002 Certified Terminal

Facilities

Product Storage	
HSD	54000 KLS
SKO	13500 KLS
MS	36500 KLS
Lubricants	150 kl (10000 Barrels + 5000 Packs)
Loading Gantry	
HSD	18 Bays
SKO	06 Bays
MS	03 Bays
MS + HSD	03 Bays
Total	30 Bays (33 Loading Arms)
Pumps	
HSD	05X415 M^3 / HR
SKO	03X238 M^3 / HR
MS	02X238 M^3 / HR
Power	
Sanctioned Load	900 KVA (33 KV Incomer)
Transformer	1600 KVA
DG Sets	2 X 500 KVA – Lant Load 1X1140 KVA – Lighting Load
Fire Safety	
Fire Water Storage	2 X 2460 KLS Vertical Tanks
Water Source	5 X 15 M^3 / HR Borewells
FIRE PUMPS	5 X 410 M^3 / HR (Engines on Auto) x X 10 M^3 / HR Jockeys
Hydrant System	Closed Ring System with 19 Monitors, 80 Double Headed 2 Single Headed and 30 (@ 10 per HSD Tank) Revolving Head Hydrant Points
Sprinkler System	Medium Velocity @ 3 LPS – ON HSD (3 Rings) & MS (2 Rings) Tanks
Fixed Foam Installation	Balanced Proportionate System

Effluent Treatment	
Oil Water Separator	Tilted Plate Interceptor Type Oil Content in Treated Water Less than 10 ppm
Communication	
Plant	PA Paging System and Mobile Motorola Handsets
Buildings	Intercom
P&T	8 Lines (Including Fax)
Plant Automation	
Tank Farm	Automatic Tank Level Temperature & Alarm Gauges
Tank Truck Loading	Batch Controllers
Control Room	Loading Rack Computer System
Quality Control	
Fully Equipped Laboratory for Testing All types of Petroleum Products	
Mobile Laboratory for Carrying Random & Surprise Tests at Various Consumption Points	

Tank to Tank Inter-Distances

Annexure – 2

A) INTERDISTANCES & SAFETY DISTANCES BETWEEN FACILITIES:

		Recommended (Mtrs.)	Actual
1.	Between tank farm & pump house	8	47.5 MTRS
2.	Between tank farm & TLF	15	137.5 MTRS
3.	Between tank farm & Fire water Pump house	30	85.0 MTRS
4.	Between TLF & Office	15	140.0 MTRS
5.	Between pump house & Sub station	15	250.0 MTRS
6.	Between storage tanks and compound wall	15 (Dia of tank)	57.0 MTRS
7.	Between storage tanks & dyke wall	Half the height of the tank	20.0 MTRS

B) DYKE CALCULATION

(KLS)

PRODUCT	DYKE VOLUME REQUIRED AS PER OISD	ACTUAL DYKE VOLUME
MS	5546	7255
HSD	18139	21894
SKO	4600	6380

Salient Observations: External Safety Audit **Annexure – 3**

August 8, 1997

The Executive Director,
Oil Industry Safety Directorate,
Ministry of Petroleum & Natural Gas,
407, New Delhi House,
New Delhi.

Dear Sir,

Sub: External Safety Audit conducted at IOC'S Jaipur TOP during 5th-8th Aug'97.

In line with your letter reference No.SAD-1.0/MC/JKV dated 7th July, 1997 an external safety audit of IOC'S Jaipur Terminal (TOP) was carried out from 5th to 8th August'97 by the team comprising of :

1.	Shri N.N. Kakkar, Director(MC) OISD, New Delhi.	Coordinator
2.	Shri Ashok Datta, DGM(HR) IBP Co.Ltd. Mumbai.	Convenor
3.	Shri M. Kute, CIM, BPCL, Mumbai.	Member
4.	Shri M. Prakash, Dy.CCOE(Retd) New Delhi.	Member
5.	Shri B.Ravi, DGM(Retd.IOC) Kochi.	Member

The Jaipur Terminal of IOC was commissioned on 3rd March, 1996. It is located at Village Sitapura, 18 kms south west of Jaipur City on NH-12. It is the Third TOP on the Kandla- Bhatinda pipeline. The Terminal handles MS, SKO and HSD and Lubricants. SKO and HSD are received through the KBPL, the Pipeline Division's Delivery Terminal being situated adjacent to the Jaipur TOP. MS is received through tank lorries from Kandla.

The location caters product to the ROs and distributors in Tonk, Jaipur, Sikar, Jhunjhunu and Churu. It also bridges products to other depots in Rajasthan & U.P.

The Terminal has a spread over area of 105 acres. The total storage capacity for MS, SKO and HSD are 16500, 13740 and 54000 KLs respectively.

It has got a truck loading gantry having 30 bays (MS-3, HSD- 18, SKO-6 and 3 mixed load bays of MS and HSD). The loading capacity is 540 T/Ts per shift.

The Terminal is provided with automation facilities for automatic gauging, temperature and density recording system.

The salient observations during the audit is as under:-

a) The House keeping of the location is excellent.

b) The location has accident free record since commissioning.

c) The terminal is provided with automation facilities of state of art technology. Some salient features of the same are as under :-

    i) Ensures very high level of safety & security for the Terminal.

    ii) Gives on spot picture of the various operational activities/stock position of the Terminal.

    iii)Control Room provides auto shut off switch which puts off of the entire systems as well as can make the Electrical isolation of the Terminal in case of emergency which can be spotted on Fire alarm panel stationed inside the Control Room.

d) The facilities are well maintained and match with OISD 118 requirements.

e) The Terminal has provided enough Tank lorry parking space.

f) As per the precommissioning inspection conducted on 20.8.95, the Acceptance Committee recommended ten points, out of which one point,i.e.provisionof fuel tanks of the fire engines outside the Pump House, is yet to beimplemented. Necessary action may be taken by the Terminal.

g) The committee conducted a fire drill on 6.8.97 and have made some recommendations in the area of improvement. It is suggested that standard action may please be taken in this regard.

h) The team observed that the Fire Extinguishers of some contractors' tank lorries were defective and not of standard make. Checking of Tank Trucks, therefore, befurther intensified.

i) This newly commissioned terminal is managed by a team of young and energetic officers and staff headed by a very good leadership of the Terminal Manager.

The committee wishes to place on record the excellent cooperation received from the Terminal Manager and his entire team as well as DGM(O) NR and other officials from the Regional Office during the period of audit.

8/8/97

(ASHOK DATTA) (M.L. KUTE) (N.N.KAKKAR)

8/8/97

(B. RAVI) (M. PRAKASH)

The report along with check list and annexure was discussed with us.

(S.S.MISHRA)
TERMINAL MANAGER

(P.K.ATREYA)
DGM(O)
IOC,NR

Consent to Operate (Initial)
(Air Prevention & Control of Pollution Act, 1981)

RAJASTHAN STATE POLLUTION CONTROL BOARD
4, INSTITUTIONAL AREA, JHALANA DOONGRI, JAIPUR

F.12(18-133)RPCB/GR.III / 1190 Dt. 23-8-95

M/s. Indian Oil Corporation Ltd.
KBPL - TOPS
Sitapura Industrial Area,
Sanganer, Jaipur.

Sub: Grant of **Consent to Operate** under Air (Prevention & Control of Pollution) Act-1981.

Ref: Your letter no. Nil Dt 27.6.95 and subsequent correspondence.

Sir,

Consequent upon the examination of consent to operate application submitted by you vide letter no Nil dt. 27.6.95 and the relevant documents enclosed therewith, your case of consent to operate has been considered and consent to operate is hereby granted **upto 31.7.98** under the provisions of section 21(4) of the Air (Prevention & Control of Pollution) Act-1981 as amended vide an Act of 1987 subject to following terms and conditions :-

1. That you shall achieve prescribed standards of emissions from the various stack attached to different plant as per the details submitted by you in your consent to operate application form. The emissions standard in your case shall be :-

Pollutant	Ambient Air	Stack
SPM	500 ug/M^3	
SO_2	200 ug/M^3	
NOx	200 ug/M^3	
CO	5000 ug/M^3	

2. That you shall provide the necessary infrastructure facilities for the monitoring of stack emmissions in accordence with the suggestion given to you by the Pollution Control Board's Officials from time to time.

3. That you shall provide safe stack height attached to diesel pumps of capacity 50 lt/hr/pump and 12 lts/hr/pump.

4. That this consent to operate is for the storage of Motor Spirit, superior Kerosene and High speed diesel upto capacity 18,330 KL, 15,240 KL and 60,000 KL respectively.

5. That, this consent to operate is for existing plant and process and separate consent to operate is required to be taken for any addition/modification/alteration or change before starting the production.

6. That you are required to apply one month in advance for renewal of consent to operate before expiry of this consent to operate.

7. That all the general conditions as per comprehensive guidelines shall be complied with.

8. That you shall submit monthly compliance report of all the above conditions in details.

9. That this consent to operate shall in no case be treated as NOC for further expansion, if any.

Please note that non-compliance of any of the above conditions would tantamount to revocation of consent to operate and you shall be liable for prosecution under the relevant provisions of the aforesaid Act.

Your's Faithfully

(B.K. SURANA)
MEMBER SECRETARY

Copy forwarded to :-

1. EE.RO,RPCB Jaipur to ensure the compliance of above.
2. PA to MS.RPCB,Jaipur.
3. Computer Cell,RPCB,Jaipur.
4. Consent register, G-III.RPCB,Jaipur.

GROUP INCHARGE

Consent to Operate (Revised)
(Air Prevention & Control of Pollution Act, 1981)

Annexure – 5

CON-A1201NE

Regd.AD

RAJASTHAN STATE POLLUTION CONTROL BOARD
4,INSTITUTIONAL AREA,JHALANA DOONGRI,JAIPUR

No.F 12(18-138)RPCB/Gr.III 1190

Dt. 17/6/2000

M/s Indian Oil Corporation Ltd.,
(Oil Storage Depot)
KBM.TOS Sitapura Industrial Area
Sanganer, Jaipur

Sub: Grant of consent to operate under Air (Prevention & Control of Pollution)Act 1981.

Ref: Your consent application No. NIL dt. Nil and subsequent correspondence.

Sir,

Consequent upon the examination of compliance of consent conditions and the matter of grant of consent as applied by you,the consent to operate under Air (Prevention & Control of Pollution)Act 1981 is hereby granted from 31.12.1999 to 31.12.2000 under the provisions of section 21/4 of the Act as amended vide Act of 1987 subject to the following terms and conditions.

1. That all the conditions imposed vide letter No. F.12(18-138)RPCB/Gr.III/1504-07 Dt. 29.10.96 shall be strictly complied with.

2. That the height of stack attached to all the oil fired sources shall be raised to minimum 11 m within 8 weeks under intimation to this office & Regional Office.

It must,however,be added that non compliance of any of the above referred conditions would tantamount to revocation of this consent to operate and you shall be liable for prosecution under the relevant provisions of the aforesaid Act.

Yours faithfully,

Member Secretary

Copy to:
1.I.C. RO,RPCB,Jaipur(North) to ensure the compliance of above.
2.Consent Register, Gr.III
3.Registry,RPCB,Jaipur.

Incharge Gr.III

Monitoring Results Ambient Air Quality **Annexure – 6**

Enkay Enviro Services

Specialization in Environmental Studies & Design of ETP

AMBIENT AIR MONITORING

Client : M/s I.O.C.Ltd

Location : Sitapura

Sample reference : 0102 (A)

Date of monitoring : 06.2.2000

Location of sampling : IOCL Campus

Ambient air temperature : 19 ^{0}C

Relative humidity : 32 %

Pressure (MMHG) : 750

Wind speed (Avg.) : < 4 km/hr

Wind direction (predominant) : N

Duration of sampling : 8 hrs

Flow rates (M^3 / min) : 1

Initial weight of filter paper (gms) : 2.54

Final weight of filter paper (gms) : 2.55

Suspended Particulate (ug/m^3) : 96.45

Sulphur di-oxide (SO_2) (ug/m^3) : 40.00

Oxides of nitrogen (Nox) (ug/m^3) : 51

Fluorides (F) (ug/m^3) : nil

Sampling carried out by :Mr. Pankaj Choudhary

Company's representative present : Mr. Rakesh Garg

Remarks : Satisfactory

Pankaj

Signature

EES

Enkay Enviro Services

Specialization in Environmental Studies & Design of ETP

AMBIENT AIR MONITORING

Client : Indian Oil Corporation Ltd.

Location : Sitapura

Sample reference : 0495 (A)

Date of monitoring : 19th Sep.'2000

Location of sampling : IOCL Campus

Ambient air temperature : 37|C

Relative humidity : 48%

Pressure (MMHG) : 750

Wind speed (Avg.) : < 4 km/hr.

Wind direction (predominant) : NE

Duration of sampling : 8 hrs.

Flow rates (M^3 / min.) : 1

Intial weight of filter paper (gms) : 2.69

Final weight of filter paper (gms) : 2.71

Suspended Particulate (ug/m^3) : 119.70

Sulphur Di-oxide (SO^2) (ug/m^3) : 38.00

Oxides of Notrogen (Nox) (ug/m^3) : 47.00

Flourides (F) (ug/m^3) : Nill

Sampling carried out by : Mr. Pankaj Choudhary

Company's representative present : Mr. R. Seshadri

Remarks : Satisfactory

Pankaj

SIGNATURE

Consent to Operate (Initial)
(Water Prevention & Control of Pollution Act, 1974)

Annexure – 7

RAJASTHAN STATE POLLUTION CONTROL BOARD
4,INSTITUTIONAL AREA,JHALANA DUNGRI,JAIPUR

NO:F.12(18-138)RPCB/G-III/95/ 1186

Date: 23-8-95

To,

M/s Indian Oil Corporation Ltd. (Mkt.Div)
KBPL - TOPS
Sitapura Industrial Area,
Sanganer, Jaipur

Sub:- Consent to operate for discharge of Industrial /Domestic effluent under Water (Prevention & Control of pollution) Act-1974

Ref:- Your consent application no.Nil date 27.6.95 and subsequent correspondence

Consent to operate is hereby granted for discharge of the industrial/ domestic effluent from your industry/premises under section 25/26 of the Water (Prevention & Control of Pollution) Act-1974 (With its amendment from time to time) subject to the following conditions:-

1. That this consent to operate is valid upto 31.7.98.

2. That his consent to operate is valid for storage of following products:-

Sno	Item	Quantity
1.	Motor Spirit	18,330 KL
2.	Superior Kerosene	15,240 KL
3.	High Speed Diesel	60,000 KL

No change in process/products without prior permission.

3. That the maximum daily discharge shall not exceed the following:-

	Type of effluent	Max. discharge (KLD)
a)	Domestic	45
b)	Industrial (Process,floor and equipment washing,cooling and bleed waters)	45

4. That the industrial effluent shall be treated before disposal so as to conform to the prescribed prescribed the Board viz the general standards for discharge of effluent as notified under Environment (Protection) Act,1986..... The main parameters for regular monitoring shall be as under:-

S. No.	Parameters	Limits
1	pH	Between 5.5 to 9.0
2	Total suspended solids	Not to exceed 100 mg/l
3.	Oil & Grease	Not to exceed 10 "
4.	BOD	Not to exceed 30 "
5	COD	Not to exceed 250 "

5. That the domestic effluent shall be disposed off in soak pits through properly designed septic tanks.

6. Samples of treated industrial Effluent shall be collected at the terminal manhole once in a month on any fixed working day of normal production and shall be analysed for all the parameters in respect of which limits have been fixed vide condition no. 4 stated above. Report of analysis shall be submitted to the Board regularly/ or immediately after the analysis is completed. Methods of sampling and testing shall be as per IS:4733 and IS:2433 or methods approved by Board as the case may be for Domestic and Industrial Effluent.

7. The applicant shall make an application for renewal of consent to operate in the prescribed form in triplicate along with the requisite consent to operate fees,atleast 30 days before the date of expiry of consent to operate or 30 days before the "New or altered outlet" is proposed to be made,whichever is earlier.

8. All conditions and instructions as provided in the "General conditions for consent to operate to operate under the Water Act. 1974 as per comprehensive Guide lines 1994 as published by the Board's shall be complied with strictly.

9. Not withstanding anything contained in this conditional letter of consent to operate,the State Board hereby reserves to it the right and power under section 37(2) of the Water (Prevention and control of pollution) Act-1974 to review anyone/or all the conditions imposed herein above and to make such variation as deemed fit for the purpose of the Act by the State Board.

10. Hydraulic loading in case of application of treated Trade Effluent or sewage Effluent on land for irrigation purposes shall be in accordance with following norms:-

Soil Texture	Dosage of settled industrial Effluent applied (BOD upto 300 mg/L) M^3/Hectare/Day
Sandy	180 to 226
Sandy Loam	134 to 180
Loam	90 to 134
Clay Loam	44 to 90
Clayey	28 to 44

11. The industry shall comply the Water (Prevention and control of pollution) Ces Act-1977 and submit Cess returns regularly and deposit the Cess as per assessment order.

12. That the Industry shall comply with the provisions of Hazardous Waste (Management & Handling) rules,1989 and manufacture, storage and import of Hazardous chemicals rules,1989 notified under Environment (Protection) Act-1986.

13. That the Industry shall submit its monthly compliance report of all the above stated conditions by first week of following month.

14. That this consent to operate in no case be treated as "NO OBJECTION CERTIFICATE" for further expansion,if any

Please note that non-compliance of any of the above stated conditions would tentamount to revocation/ withdrawal of this consent to operate and the industry shall be liable for prosecution under the provisions of Water (Prevention & Control of pollution) Act -1974.

MEMBER SECRETARY

Copy to following for information / to ensure the compliance of consent conditions / further necessary action -

1. The RO.RPCB, Jaipur to monitor the compliance of consent conditions and report accordingly.
2. PA to Ms, RPCB, Jaipur
3. Computer Cell,RPCB,Jaipur.
4. Consent register, G-III, RPCB, JAIPUR.

GROUP INCHARGE

Consent to Operate (Revised)
(Water Prevention & Control of Pollution Act, 1974)

Annexure – 8

CON-A120INF

Regd.AD

RAJASTHAN STATE POLLUTION CONTROL BOARD
4,INSTITUTIONAL AREA,JHALANA DOONGRI,JAIPUR

No.F 12(18-138)RPCB/Gr.III 1184 Dt. 17/4/2000

M/s Indian Oil Corporation Ltd.,
(Oil Storage Depot)
RIICO Sitapura Industrial Area
Sanganer, Jaipur

Sub: Grant of consent to operate under Water (Prevention & Control of Pollution)Act 1974.

Ref: Your consent application No. Nil dt. Nil and subsequent correspondence.

Sir,

Consequent upon the examination of compliance of consent conditions and the matter of grant of consent as applied by you,the consent to operate under water(Prevention & Control of Pollution)Act 1974 is hereby granted from 31.12.1999 to 31.12.2000 under the provisions of section 25/26 of the Act as amended from time to time subject to the following terms and conditions

i. That all the conditions imposed vide letter No. F.12(18-138)RPCB/Gr.III/1508-11 Dt. 29.10.98 shall be strictly complied with.

It must,however,be noted that non-compliance of any of the above referred conditions would tantamount to revocation of this consent to operate and you shall be liable for prosecution under the relevant provisions of the aforesaid Act.

Yours faithfully,

Member Secretary

Copy to:
1.P.O., RO,RPCB,Jaipur(South) to ensure the compliance of above
2.Consent Register, Gr.III
3.Registry,RPCB,Jaipur.

Incharge Gr.III

Monitoring Results: Treated Water Analysis **Annexure – 9**

Enkay Enviro Services

Specialization in Environmental Studies & Design of ETP

Dated : 20.09.2000

RESULTS OF TREATED WATER ANALYSIS

Name of Work : Analysis of Treated Water Analysis (Indian Oil Corporation Ltd.)

Date of Collection : 16.09.2000

S.No.	Parameters	Results
1.	pH	7.05
2.	TSS	691
3.	COD	76.8
4.	BOD	24
5.	Oil & Grease	5.6

Note : All units are given in mg/l except pH.

Pankaj

(INCHARGE)

24-B, DADU MARG, GOPAL BARI, JAIPUR-302 001 (RAJ.) INDIA

EES

Enkay Enviro Services

Specialization in Environmental Studies & Design of ETP

DATED 06.02.2000

RESULTS OF TREATED WATER ANALYSIS

Name of Work : Analysis of Treated Water Analysis (Indian Oil Corporation Ltd)

Date of Collection : 31.01.2000

S.No	Parameters	Results
1.	pH	7.30
2.	TSS	533
3.	COD	56.2
4.	BOD	21
5.	Oil & Grease	2.7

Note : All units are given in mg/l except pH

Pankaj
(INCHARGE)

Monitoring Results: Raw Water Sample

Annexure – 10

Malaviya Regional Engineering College

JAIPUR - 302 017 (Rajasthan)

Telegram : MRENGCOL

Phone : 702054 Principal
702109
702524 P.T.P.
702955 Registrars/Dy. Reg.
702710 Store Officer
702735 Estate Engineer
Fax : 0141-702954
EPABX - 702578, 702107

No. PCE/MREC/PHE/2000/20

Dated 16-3-2000

The Terminal Manager,
Indian Oil Corporation Ltd.,
Sitapura, Jaipur

NATURE OF THE SAMPLE - RAW WATER SAMPLE

ANALYSIS REPORT

S.No	Tests	Results
1.	Appearance	Colourless
2.	pH	7.7
3.	Chlorides (as Cl)	36
4.	Sulphates (as SO_4)	28
5.	Total Dissolved Solids	960
6.	Total Suspended Solids	31
7.	Total Alkalinity (as $CaCO_3$)	833
8.	Total Hardness (as $CaCO_3$)	92
9.	Fluorides	0.7
10.	Nitrates	21

Note : i) All values except pH are expressed in mg/l
ii) The water sample was collected and delivered by the party at M.R.Engineering College, Jaipur

I/c LAB

PCE & HEAD

PRINCIPAL

Oasis Test House Limited
SP-2, 22 Godam Industrial Estate.
JAIPUR-302 006
Gram : Jaipharma
Phone : 211254, 211417
Telex : 0365-2653-OASI-IN
Fax : 0141-212411

OASIS
TEST HOUSE LIMITED

Certificate of Analysis

1. Name of Manufacturer/Party INDIAN OIL CORPORATION LTD, JPR Mfg. Lic. No.
2. Reference No. of Letter - Dated 14-2-99 3. Sample received on 14-2-9
4. Name of Sample BOREWELL
5 Details of Raw material/final Product (in bulk/finished pack)
(a) Original Manufacturer's Name
(b) B. No. - (c) Sample Qty. 1x1Lit. (d) D. M. - (e) D. E. - (f) B. Size -
6 Results of Test/Analysis

Chemical Analysis:		Method & Desirable limit per IS: 10500-1991.
Total dissolved solids	: 948.00 mg/L	500.00 mg/L Ma
Total hardness cal.as $CaCO_3$	: 80.09 mg/L	300.00 mg/L Ma
Calcium cal.as Ca	: 12.02 mg/L	75.00 mg/L Ma
Magnesium cal.as Mg	: 12.15 mg/L	30.00 mg/L Ma
Chloride cal.as Cl	: 53.63 mg/L	250.00 mg/L Ma
Alkalinity to Methyl orange cal.as $CaCO_3$	: 849.25 mg/L	200.00 mg/L Ma
Sulphate cal.as SO_4	: NIL	200.00 mg/L Ma
Nitrate cal.as NO_3	: 2.21 mg/L	45.00 mg/L Ma
Fluoride (as F)	: 0.5 mg/L	1.00 mg/L Ma

Note: Party asked for above test/s only.

Date 27-[illegible]-99

Person-in charge of testing

Note :—(1) SAMPLE NOT DRAWN BY US.

Monitoring Results: Noise Levels

Annexure – 11

Enkay Enviro Services

EES

Specialization in Environmental Studies & Design of ETP

Dated : 20.08.2000

RESULTS OF NOISE LEVEL MONITORING

Name of Work : Analysis of Noise Level Monitoring (Indian Oil Corporation Ltd.)

Location : ATIOC Campus

S.No.	Location	Day time (dB)
1.	D.G. Set	96
2.	Fire Water Pump House	95
3.	Product Pump House	88
4.	TLF Plant	65
5.	Peripheral road near boundary	58

Note : All units are in the Decibal.

Pankaj

(INCHARGE)

24-B, DADU MARG, GOPAL BARI, JAIPUR-302 001 (RAJ.) INDIA

EES

Enkay Enviro Services

Specialization in Environmental Studies & Design of ETP

DATED : 06.02.2000

RESULTS OF NOISE LEVEL MONITORING

NAME OF WORK : Analysis of Noise Level Monitoring (Indian Oil Corporation Ltd.)

Location : At IOC Campus

S.NO.	Location	Day time (db)
1.	D.G.Set	90
2.	Fire Water Pump House	92
3.	Product Pump House	81
4.	T.L.F Plant	69
5.	PeriferalRoad Near Boundary	52

Note : All units are in decibals

Pankaj

INCHARGE

24 B, DADU MARG, GOPAL BARI, JAIPUR-302 001 (RAJ.) INDIA

COMPREHENSIVE HEALTH ANALYSIS & REINFORCEMENT FOR LOCATION ____________
ON ____________.

	OBSERVATIONS
5. FACILITIES	
i) CONDITION OF FLOOD LIGHTS	High mast towers provided.
- IS GASKET PRESENT	Yes
- IS GLASS COVER IN GOOD CONDITION	Yes
- IS CONTROL GEAR CONDITION OK	Yes
j) PRODUCT PIPELINE PROVIDED WITH FLANGE EARTH JUMPER CONNECTION	Yes
6. ADEQUATE ILLUMINATION EXIST	
- T/W LOADING/UNLOADING AREA	N/A
- TANK LORRY FILLING	Yes
- PRODUCT PUMP HOUSE	Yes
- FIRE PUMP HOUSE	Yes
- TANK FARM AREA	Yes
- ELECTRICAL ROOMS	Yes
- CUSTODY TRANSFER POINT	Yes
- OMC EXCHANGE PIT	Yes
- ETP AREA	Yes
- WATCHMAN TOWERS	Yes
- TT PARKING AREA	Yes
- BUILDINGS	Yes
7. FLAMEPROOF-WORTHINESS	
a) LIGHTING FIXTURES FLAME PROOF AS PER AREA CLASSIFICATION	Yes
b) CONDITION OF WIRING GOOD	Yes
c) NO WATER ENTER & ACCUMULATE IN FIXTURE/DISTRIBUTION BOXES ETC.	Yes
d) NO ALLEN SCREWS MISSING	Yes
e) CABLE GLAND OF PROPER SIZE & CMRS CERTIFICATION EMBOSSED.	To ensure all Cable glands are CMRS certified In hazardous area
f) NO UNPLUGGED OPENINGS OBSERVED	Yes
g) FLP PROPERTY OF FIXTURES MAINTAINED	Yes
- STARTERS	Yes
- MOTORS	Yes
- JUNCTION BOXES	Yes
- CABLE TERMINATION	Yes
- SWITCH GEARS	Yes
- INTRINSICALLY SAFE EQUIPMENTS	Yes
- PA PAGERS	Yes
8. HOUSE KEEPING OK	
a) TANK LORRY FILLING SHED	Yes
b) TANK WAGON GANTRY	— N/A —
c) PRODUCT PUMP HOUSE	Yes
d) FIRE PUMP HOUSE	Yes

Contd..P/8

Confirmatory Letter for Status of DMP **Annexure – 13**

इंडियन ऑयल कॉर्पोरेशन लिमिटेड
Indian Oil Corporation Limited

र्केटिंग डिविजन
keting Division

JAIPUR TERMINAL
SITAPURA INDUSTRIAL AREA, SANGANER, JAIPUR – 303 905
PH : 0141- 580112, 580269, 580113 FAX : 0141- 583846

To
Mr. Harpreet S. Kandra
Research Associate
TERI
Darbari Seth Block
Habitat Place
Lodhi Road
New Delhi – 110 003

Sub : Eco Rating for Jaipur Terminal

Dear Mr. Kandra,

With reference to your letter dated 17-10-2000, following is the status of points you had requested for:

1) The updated DMP has been accepted by Dy. Chief Inspector, Factories & Boilers on 13-10-2000, which is as good as approval, if nothing further is heard within a month (i.e) by 12-11-2000. Further a copy has also been submitted to District Magistrate's Office for vetting.
2) All point s raised in the Electrical Audit conducted by PDIL in August 1999, have been complied with. A copy of the compliance IOM sent to our Controlling Office is enclosed for your reference.

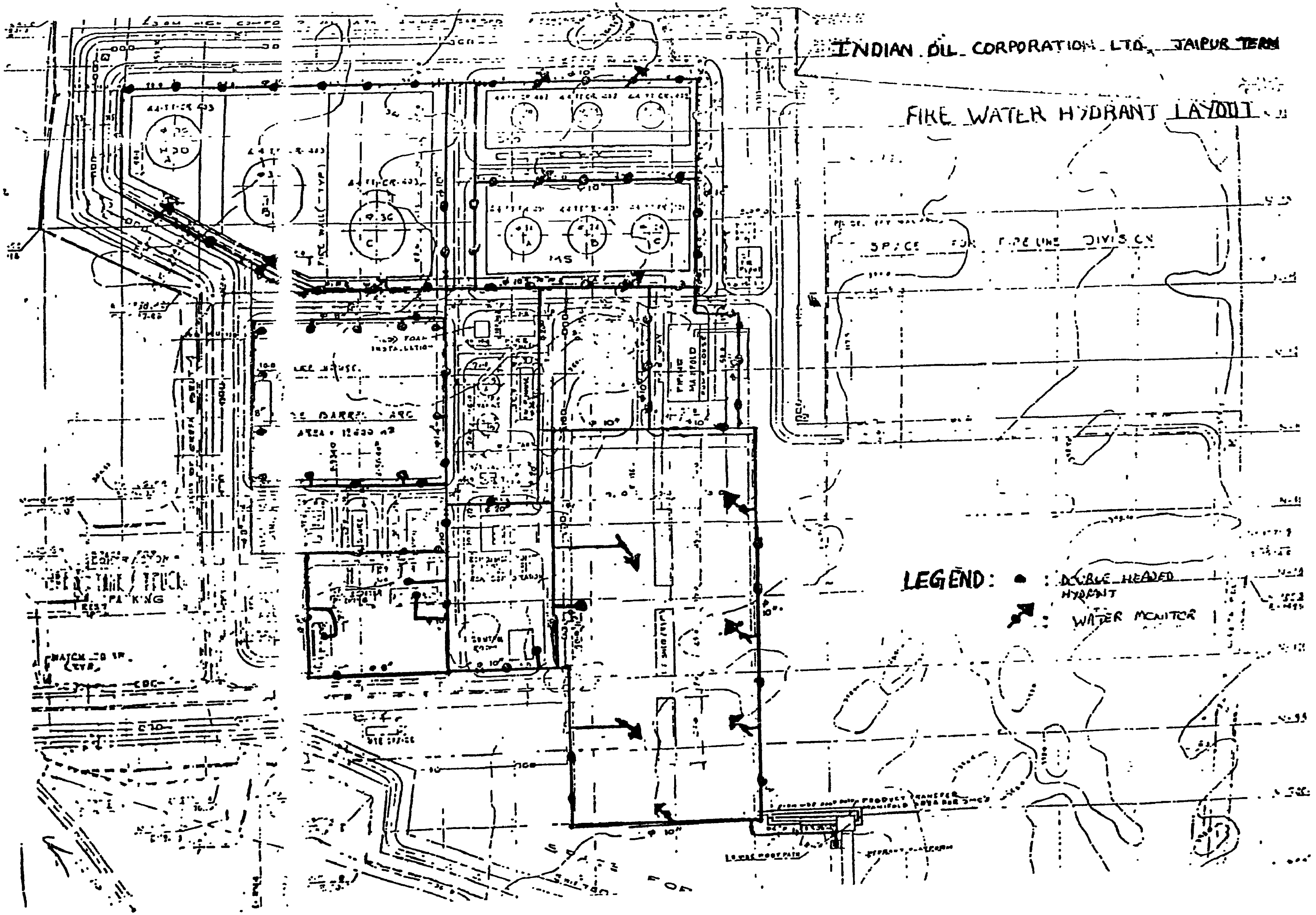
Kindly let us know of any other queries that you have on the subject.

With regards,

(R. Sayal)
Terminal Manager

INDIAN OIL CORPORATION LTD., JAIPUR TERM

FIRE WATER HYDRANT LAYOUT



Fire Water Calculation

Annexure – 15

ASSUMPTION

TANK NO.: 403-B ON FIRE

A.

1. Water required for cooling the tank on fire : 407 M3/HR
2. Water required for cooling the tanks within (R+30) M radius from centre of tank on fire : NIL
3. Water required for cooling the tanks outside R+30 M radius from centre of tank on fire : 271 M3/HR
4. Water required for applying foam on large fixed roof/floating roof tank: : 305 M3/HR

A = 1+2+3+4 = 983 M3/HR

B.

i) Water requirement for 4 hydrants (4x36) = 144m3/hr

ii) Water requirement for 1 monitor (1x144) = 144m3/hr

Total B = 288 m3/hr

A OR B whichever is higher

Water storage for 4 hrs. = 3017 M3

OR

Water storage for 3 hrs.,if, make up water is 50%

Total Water requirement = 3017 KL

Present water storage = 4920 KL

Additional Tankage requirement = NIL

FIRE WATER PUMPS :

MAIN PUMPS - 3

STANDBY - 2

EXISTING PUMPS - 5

AM CALCULATION:

Foam requirement for largest fixed roof tank = 9.15 M3/HR

OR

Foam requirement for largest floating roof tank= 1.25 M3/HR

OR

Foam monitor	- 4320 litres
Hoses	- 4104 litres

	8.424 KL

Foam storage for 30 minutes : 4.58 M3

Present tankage available for FOAM : 10 KL

Fire Fighting Infrastructure

Annexure – 16

A:	Area	10 Kg.DCP	Actual	75 Kg.	Actual
1.	Petroleum product warehouse, package	2 per 200m2 area	02		
2.	Pump house Class A & B Class C	1 per 2 pumps max. 4 nos. 1 per 4 pumps	04		
3.	T/T loading & unloading gantry	1 per 2 bays	18	1 No.	01
4	T/W loading & unloading gantry	1 per 30mtr.	N.A.	1 No.	N.A.
5.	Office Canteen/ Store	2 nos.each	06		
6.	Electric MCC room	1 no.4.5Kg. CO2per 25 m2 area.			

B.	**WHEELED EQUIPMENT**	**Required**	**Actual**
1.	Wheeled portable water/ foam monitor 2400 ltr/min.	04	04
2.	Foam compound trolley 200/210 litres	03	03
3.	200 Kg. DCP trolley	04	04
C.	**HOSES/NOZZLES**		
1.	Fire hoses (30% of hydrant points or min. 10 nos.)	44	140
2.	Jet nozzles with branch pipe (IS:903)	4	75
3.	Fog nozzles (IS:952)	4	08
4.	Universal nozzles (IS:2171)	4	08
5.	Foam Branch pipes (IS:2097)	4	08

D. ACCESSORIES

1.	DC Powder : (50% of fire extinguishers)	780 KG	900 KG
2.	Cc2 Catridges : (50% of fire extinguishers)	21	40
3.	Sand Scoops	4	10
4.	Safety helmets	8	12
5.	Water curtain nozzles	2	02
6.	Stretcher	1	02
7.	First Aid Box with anti snake serum	1	04
8.	Rubber hand gloves for electric jobs	3	03
9.	Explosivitimeter	1	01
10.	Fire entry suit w/o Breathing apparatus	2	02
11.	Resuscitator	2	04
12.	Electric siren 3 km range	2	02
13.	Hand operated siren	1	02
14.	Water jel blankets	As required.	04
15.	Red/Green flag for fire drill	1 each	06
16.	Position pressure type self contained breathing appratus with spare cylinder (30 minutes)	1	04

Tank Truck Safety Checklist

Annexure – 17

इंडियन ऑयल कॉर्पोरेशन लिमिटेड

जयपुर टर्मिनल

दिनांक : ....

टैंक ट्रक सेफ्टी चैकलिस्ट

टैंक ट्रक नं.

ट्रांसपोर्टर का नाम

क्र.स.	**चैकलिस्ट के पॉइन्ट**	**स्टैटस**
1.	कार्ड न. कार्ड की समाप्ति की दिनांक ड्राईवर व खलासी	ड्राईवर खलासी
2.	लाइसेंस न. व समाप्ति की दिनाक	
3.	हजार्डस गुड्स ट्रेनिग सर्टिफिकेट न. व ड्राइवर को दिनाक	
4.	एक्सपलोसिव लाईसेंस की समाप्ति की दिनांक	
5.	केलिब्रेशन समाप्ति की दिनाक	
6.	सी सी ई द्वारा प्रमाणित नक्शे की दिनाक	
7.	सी सी ई द्वारा प्रमाणित फ्लेम अरेस्टर	
8.	सुरक्षा वाल्व पर सीसे का फ्यूज प्लग उपलब्ध हे	
9.	मैनहोल पर सीसे का फ्यूज प्लग उपलब्ध हे	
10.	पी वी वाल्व कार्यशील हे	
11.	दो नग 10 कि.ग्रा. फायर एक्टिवंग्यूसर कार्यशील है और चैक करने की दिनांक अंकित है	
12.	300 मि. एम्पीयर बैटरी कट ऑफ स्विच कार्यशील हे और फिलिंग के दौरान बन्द की हुई है	
13.	मास्टर वाल्व कार्यशील है	
14.	मैन हॉल कवर के बोल्ट बैल्ड की हुई है	
15.	मैन हॉल केलिब्रेशन चार्ट में अंकित सील न. से सील की हुई है	
16.	फिल पाइप नक्शे मे अकिंत लम्बाई और तिरछा कटा हुआ है	
17.	डिप पाइप में आवश्यकतानुसार छेद की हुई है और नक्शे की ल. के अनुसार है	
18.	लोहे की शीट केबिन और टैंक के बीच में उपलब्ध है	
19.	आवश्यक टेलीफोन न. इमरजेन्सी पैनल मे अंकित है	
20.	सर्विस टैंक जाली के अन्दर है ताला लगा हुआ हं और नीचे ड्रेन प्लग उपलब्ध हे	
21.	टी टी का केबिन ज्वलनशील पदार्थ से बना हुआ नहीं है	
22.	खुला तार टी टी में नहीं है	
23.	पीली पट्टी टैंकों के दोनों तरफ की हुई है	
24.	टी टी संख्या व कम्पार्टमेन्ट मात्रा टैक पर लिखी हुई है	
25.	केलिब्रेशन व सफाई की तारीफ टैंक के पीछे लिखी हुई है	
26.	टैक व मैनिफोल्ड से रिसाव नही है	
27.	निरीक्षण के लिए प्लेटफार्म टेक के ऊपर उपलब्ध है	
28.	इंजन सैल्फ स्टॉर्ट में है	
29.	बैटरी लकडी के बक्से में रखी हुई है	
30.	अर्थिग पट्टी टैंक के दोनो तरफ ऊपर उपलब्ध है	
31.	खुला डिब्बा टी टी केबिन में नहीं है	
32.	प्रमाणित ग्लास फ्यूज डिस्ट्रीब्यूशन बॉक्स में उपलब्ध है और शॉट नहीं की हुई है	
33.	इमरजेसी शट ऑफ वाल्व कार्यशील है	
34.	बोनट के अन्दर खुली तार नहीं है	
35.	रूट मेप टी टी में उपलब्ध है	
36.	11 मैस की जाली हवा लेने की पाइप लाइन पर उपलब्ध हं	
37.	टी टी की एक्जास्ट केबिन के अग्र भाग मे है	

ड्राईवर के हस्ताक्षर **निरीक्षण अधिकारी के हस्ताक्षर** **अनुरक्षण स्टाफ के हस्ताक्षर**

इंडियन ऑयल

Indian Oil

इंडियन ऑयल कॉर्पोरेशन लिमिटेड

विपणन प्रभाग

जयपुर टर्मिनल

स्थाई (परमानेंट) गेट पास पंजिक

लाइसेंस्ड/अनलाइसेंस्ड एरिया

कार्डधारक का विवरण

नाम ______

पिता का नाम ______

स्थाई पता ______

______

सत्यापनकर्ता : पुलिस थाना/चौकी ______

ड्राईविंग लाइसेंस संख्या : ______

ट्रांस्पोर्टर/ठेकेदार का विवरण :

फर्म का नाम : मैसर्स ______

फर्म का पता : ______

क्रम सख्या :

जारी होने की दिनांक : ....

गेट पास वैद्यता विवरण हस्ताक्षर

मान्य ....से....................तक

मान्य ....से....................तक

मान्य ....से....................तक

मान्य ....से....................तक

लाइसेंस्ड/अनलाइसेंस्ड एरिया

कार्डधारक का विवरण

नाम ______

पिता का नाम ______

स्थाई पता ______

______

सत्यापनकर्ता : पुलिस थाना/चौकी ______

ड्राईविंग लाइसेंस संख्या : ______

ट्रांस्पोर्टर/ठेकेदार का विवरण :

फर्म का नाम : मैसर्स ______

फर्म का पता : ______

क्रम सख्या :

जारी होने की दिनांक : ....

गेट पास वैद्यता विवरण हस्ताक्षर

मान्य ....से....................तक

मान्य ....से....................तक

मान्य ....से....................तक

मान्य ....से....................तक

लाइसेंस्ड/अनलाइसेंस्ड एरिया

कार्डधारक का विवरण

नाम ______

पिता का नाम ______

स्थाई पता ______

______

सत्यापनकर्ता : पुलिस थाना/चौकी ______

ड्राईविंग लाइसेंस संख्या : ______

ट्रांस्पोर्टर/ठेकेदार का विवरण :

फर्म का नाम : मैसर्स ______

फर्म का पता : ______

क्रम सख्या :

जारी होने की दिनाक : ....

गेट पास वैद्यता विवरण हस्ताक्षर

मान्य ....से....................तक

मान्य ....से....................तक

मान्य ....से....................तक

मान्य ....से....................तक

FIRE DRILL RECORD

DATE CONDUCTED 12-8-2000

FIRE DRILL CONDUCTED BY [illegible]	FIRE ALARAM GIVEN BY HARISHANKAR SHARMA	STAFF IN POSITION NO. 84	LOCATION OF FIRE BKO MANIFOLD ON TLF HEADER LINE	
TYPE OF FIRE EQUIPMENT AVAILABLE		TOTAL NUMBER	FOUND IN GOOD CONDITION	UNSATISFACTORY CONDITION
1. DRY CHEMICAL FIRE EXTINGUISHERS		52	52	
2. FOAM/OTHER TYPE FIRE EXTINGUISHERS		14	14	
3. FIRE HOSES		140-CP 95-RRL	37-CP 94-RRL	
4. INDUCTION FOAM MAKING BRANCH PIPE		4	4	
5. WATER NOZZLE		117	117	
6. SAND BUCKETS		6	6	
7. SAND SCOOPS		12	8	
8. OTHER FIRE FIGHTING EQUIPMENTS		Sprinkler & fixed foam System	Sprinkler & fixed foam system	
9. TRAILER PUMP/FIRE PUMP				
REFILL/CARTRIDGES IN STOCK NO.	FOAM SOLUTION IN STOCK (QUANTITY)		DURATION	
			FROM 1657 HRS.	TO 1707 HRS.
			TOTAL 10 mins HRS.	RECORD INSPECTED

REMARKS Fire drill was conducted on SKO Hammer blind of TLF Header Line

SIGNATURE

DESIGNATION

DATE

IM/DS/SS

COMMENTS ON PERFORMANCE OF FIRE DRILL	TRAINING IMPARTED TO IMPROVE FIRE DRILL
1) Monitor located in front of TLF Shed 1 did not operate because of damaged valve. Problem rectified after fire drill	1) Training was imparted on tackling of various other emergencies like electrical short circuit which may arise during fire fighting
2) The monitor located behind Shed 1 could not be effectively used in cooling of P/L	2) Training was also imparted on all possible safety deficiencies that might lead to fire on the TLF
3) Foam generator was not used to fight spill fire.	

1.64

FORM NO. OF 34
PART B

FIRE DRILL RECORD

DATE CONDUCTED 13.4.2000

FIRE DRILL CONDUCTED BY SH. R. SAHA	FIRE ALARAM GIVEN BY SH. R. SAHA	STAFF IN POSITION NO. 20	LOCATION OF FIRE MANIFOLD OF TK 403C

TYPE OF FIRE EQUIPMENT AVAILABLE	TOTAL NUMBER	FOUND IN GOOD CONDITION	UNSATISFACTORY CONDITION
1. DRY CHEMICAL FIRE EXTINGUISHERS	52	52	
2. FOAM/OTHER TYPE FIRE EXTINGUISHERS	14	14	
3. FIRE HOSES	140-CP 4725-RRL	40-CP 4425-RRL	
4. INDUCTION FOAM MAKING BRANCH PIPE	4	4	
5. WATER NOZZLE	117	117	
6. SAND BUCKETS	6	6	
7. SAND SCOOPS	12	12	
8. OTHER FIRE FIGHTING EQUIPMENTS	Sprinkler & direct foam system & foam generator	Sprinkler & direct foam system & foam generator	
9. TRAILER PUMP/FIRE PUMP			

REFILL/CARTRIDGES IN STOCK NO. 27	FOAM SOLUTION IN STOCK (QUANTITY) AFFF 12.574	DURATION FROM 10 50 HRS.	TO 11 15 HRS.	TOTAL 25 MIN HRS.

REMARKS

EMERGENCY RESPONSE DRILL.

PARTICIPANTS.

1) STATE FIRE BRIGADE [illegible]
2) AMBULANCE
3) HPCL
4) PIPELINE DIVISION

IM/DS/SS

RECORD INSPECTED

SIGNATURE

DESIGNATION

DATE

1711

COMMENTS ON PERFORMANCE OF FIRE DRILL	TRAINING IMPARTED TO IMPROVE FIRE DRILL
i) THROW OF WATER-CUM-FOAM MONITOR WAS OFF THE TARGET INITIALLY. BUT THE SITUATION WAS RECTIFIED AS PER INSTRUCTION OF FIRE-IN-CHIEF	i) TRAINING WAS GIVEN ON VARIOUS TYPES OF FIRES IN PETROLEUM INSTALLATIONS THROUGH VIDEO CASSETTE

Details of Mock Drill

Annexure – 19

As part of the external audit a mock drill was conducted by OISD team.The salient details are as follows:

1.0 LOCATION OF EMERGENCY : **TANK FARM (401B TANK)**

2.0 NATURE OF EMERGENCY :**Fire on Tank 401B-Roof Top**

3.0 DATE OF THE DRILL :**6.8.97**

4.0 DETAILS OF RESPONSE TIME :

SR. NO.	ACTIVITY	TIME	RESPONSE
4.1	Emergency spotted	11-30-00	Immediate
4.2	Alarm raised (Vocal/Hand-siren)	11-30-20	Immediate
4.3	Electrical Siren sounded (wailing)	11-31-00	
4.4	Sprinkler started (if applicable)	11-38-00	
4.5	Monitor started (if applicable)	11-32-00	
4.6	DCP F/E discharged (if applicable)	NA	
4.7	Rescue team on site	11-33-00	
4.8	All bulk Tts evacuated	11-37-00	
4.9	All packed trucks evacuated	NA	
4.10	Mutual aid members on site		
	a)IBP CO.LTD.	11.33.00	
	b)IOC P/L DIVN.	11.33.00	
	c)HPC LTD.	11.37.00	
	d)		
4.11	Keep adding relevant activities		
4.12	All clear given on site	11-42-00	
4.13	Electrical siren sounded for ALL CLEAR	11-42-15	

NOTE : Response time w.r.t. spotting of emergency

5.0 OVERALL ASSESSMENT OF PREPAREDNESS FOR EMERGENCIES

The facilities provided in the Terminal are of state of art technology & well prepared to fight emergency.

6.0 POSITIVE FEATURES OF THE DRILL

6.01 Response of the personnel was immediate.

6.02 Team members knew their responsibilities.

6.03 Control room acted very promptly through PA system & tried to communicate the nature/details of emergency to all sides.

6.04 Mutual aid acted promptly.

6.05 Emergency shut at control room was acted immediately.

7.0 AREAS OF IMPROVEMENTS/RECOMMENDATIONS

7.01 The security man at the entrance of TLF barrier should not leave the duty point unmanned, even in case of emergency.

7.02 The starting of sprinkler in the Tank Farm should be prompt.

7.03 The PA system did not function effectively with the result there is communication failure. The system should be made foolproof.

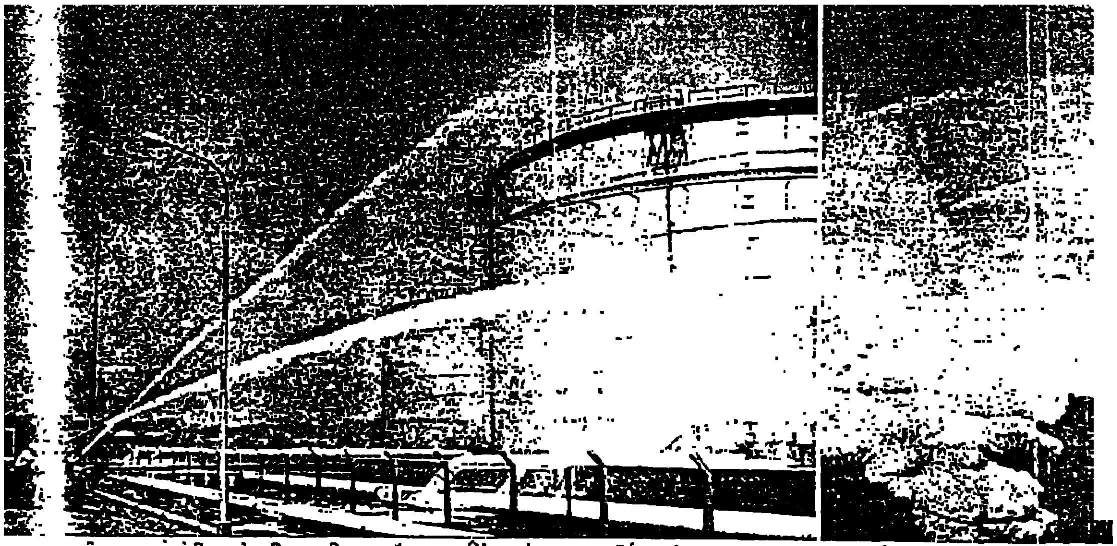
7.04 The road connecting main gate and barrier should be kept clear.

7.05 Two drivers were not available during the emergency. Care should be taken that all vehicles are manned with drivers till it goes out of the TLF zone.

News Clippings: Fire Drill Involving External Agencies **Annexure – 20**

राजस्थान पत्रिका

जयपुर, 14 अप्रेल 2000 3



जयपुर के सीतापुरा औद्योगिक क्षेत्र स्थित इंडियन ऑयल कार्पोरेशन के जयपुर टर्मिनल में गुरुवार को फायर ड्रिल हुई। टर्मिनल के कर्मचारी लक्ष्य पर फोम की बौछारें छोड़ते हुए [बाएं] तथा फोम का ढेर दाएं। बीच में फोम का पर्दा भी दिखाई दे रहा है। पत्रिका फोटो।

खतरे का सायरन बजते ही उस ओर दौड़ पड़े सभी

[कार्यालय सवाददाता]

जयपुर, 13 अप्रेल। हजारों गैलन पेट्रोलियम के भण्डार में आग लगने से होने वाले जन-धन के नुकसान का अनुमान सहज ही लगाया जा सकता है। बचाव के लिए उस जगह की अग्नि सुरक्षा व्यवस्था भी उतनी ही पुख्ता होनी चाहिए। ऐसी ही अग्नि सुरक्षा व्यवस्था का प्रदर्शन गुरुवार को सीतापुरा औद्योगिक क्षेत्र स्थित इंडियन ऑयल कार्पोरेशन लिमिटेड के जयपुर टर्मिनल में गुरुवार को किया गया।

टर्मिनल प्रबधक राजेश स्याल के प्रातः 10.45 बजे अग्नि सूचक का काच तोड़ते ही खतरे का सायरन बज उठा। अपने-अपने कार्य में लगे अग्निशमन दल, सहायक दल तथा बचाव दल के कर्मचारी नियत्रण कक्ष की तरफ दौड़ पड़े। यहां उन्हें पता लगा कि 20 हजार किलोलीटर डीजल के टैंक के निकट आग लगी है। कुछ कर्मचारी ड्राइ केमिकल के सिलेण्डर तो कुछ फोम [illegible] के जरीकेन लेकर दुर्घटना स्थल की ओर भागे। इस बीच फायर बिग्रेड, एम्बुलेंस, जयपुर एवं थानाधिकारी सागानेर सदर को भी सूचना दे दी गई। स्याल जो अब फायर-इन-चीफ की भूमिका में थे, घटनास्थल पहुंचे कर्मचारियों को बताया कि डीजल टैंक के मेनीफोल्ड वाल्व का गैसकिट फट जाने से तेल रिसाव हुआ और उसमें आग लग गई है। उन्होंने रिसाव की स्थिति बताने के लिए वहा एक लाल झण्डा भी लगा दिया। आग से प्रभावित तथा अन्य टैंकरों को ठण्डा रखने के लिए उन पर लगे स्प्रिंकलर चालू कर दिए गए। पहले आग वाली जगह पर सोडियम बाइ कार्बोनेट का पाउडर छिड़का गया। फिर आग लगने की जगह पर फोम की मोटी बौछारें की गईं।

अग्नि प्रतिरोधी सूट पहने एक जना रिसाव की जगह पहुंचा। उसने रिसाव वाल्व के दोनो ओर से वाल्व बन्द कर रिसाव वाल्व का सम्पर्क मुख्य टैंक और सप्लाई लाइन से काट दिया। पानी के साथ रसायन के सयोग से बने फोम की मोटी धार से सप्लाई काटने गए आदमी को भी सुरक्षा दी गई तथा एक फोम का पर्दा बनाया गया। इस पर्दे से आग के नजदीक जाकर उस पर फोम की बौछारें की जा सकती है।

इस समय टैंक के आसपास युद्ध क्षेत्र सा नजारा था जिसमें राजेश स्याल लाउडस्पीकर पर कर्मचारियों को निर्देश दे रहे थे, टैंक और आसपास झाग का अम्बार लग गया। इस बीच एक जने को इस कार्रवाई में घायल घोषित किया गया जिसे एम्बुलेंस में प्राथमिक चिकित्सा उपलब्ध कराई गई। ड्रिल में पास ही स्थित भारत पेट्रोलियम तथा हिन्दुस्तान पेट्रोलियम के कर्मचारियों ने भी सहयोग किया। इस दौरान डीजल तथा पेट्रोलियम से भरी गाड़ियों को सुरक्षित स्थान पर पहुंचाया गया। करीब 15 मिनट की मशक्कत के बाद प्रबधक स्याल ने आग के बुझ जाने की घोषणा की तथा खतरा टलने का सायरन बजाया गया।

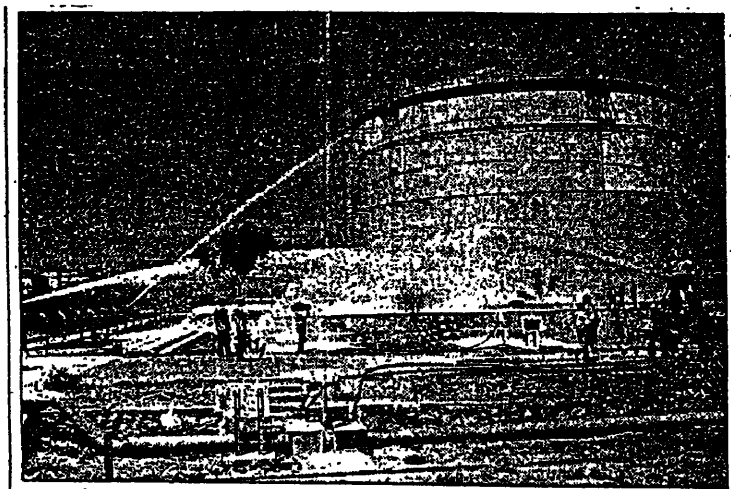
टर्मिनल मैनेजर ने बताया कि ऐसी ड्रिल माह में एक बार आवश्यक रूप से अचानक की जाती है। इस ड्रिल मे भी पूरी क्षमता तथा उपकरणों का इस्तेमाल नहीं किया गया। जयपुर टर्मिनल में 10 से 16 अप्रेल तक सुरक्षा सप्ताह मनाया जा रहा है।

भारत का सबसे तेज बढ़ता अखबार

दैनिक भास्कर

जस्थान : जयपुर, जोधपुर, उदयपुर, कोटा, अजमेर, बीकानेर, श्रीगंगानगर, म.प्र.: भोपाल, इंदौर, ग्वालियर, रायपुर, बिलासपुर, जबलपुर, सतना, उ.प्र.: झांसी

जयपुर, 14 अप्रैल 2000 शुक्रवार 5



जयपुर में गुरुवार को सीतापुरा स्थित इंडियन आयल टर्मिनल में 'फायर फाइटिंग' का अभ्यास करते हुए कर्मचारी। छाया : भास्कर

इंडियन आयल टर्मिनल में आग से बचाव का प्रदर्शन

नगर संवाददाता

जयपुर, 13 अप्रैल। इंडियन आयल कार्पोरेशन द्वारा आयोजित सुरक्षा सप्ताह के तहत आज संस्थान के सीतापुरा औद्योगिक क्षेत्र स्थित जयपुर टर्मिनल में अग्नि दुर्घटना से बचाव का प्रदर्शन किया गया।

कार्पोरेशन की ओर से गत 10 अप्रैल से शुरू हुआ सुरक्षा सप्ताह 16 अप्रैल तक चलेगा। इस दौरान कार्पोरेशन के विशेषज्ञ दलों की ओर से पेट्रोल, डीजल व केरोसिन से होने वाली अग्नि दुर्घटनाओं के कारण व इनसे बचाव के तरीकों की जानकारी दी जा रही है। इस क्रम में आज कार्पोरेशन के अग्निशमन विशेषज्ञों ने अग्नि दुर्घटना की आपातकालीन स्थिति के मद्देनजर आग पर काबू पाने के तरीकों का प्रदर्शन किया। इस दौरान अग्निशमनकर्मियों की सतर्कता तथा दमकल के प्रयोग से एकबारगी ऐसा नजारा बन पड़ा था, जैसे सचमुच आग लगी हो और उसे बुझाया जा रहा हो।

Summary report: Emergency response drill, April 2000

ANNEXURE – 21

JP/11/ERD/REPORT

TERMINAL/~~DEPOT~~ : JAIPUR TERMINAL
DATE : 13.4.2000

SUMMARY REPORT OF "EMERGENCY RESPONSE DRILL"

1.0 GENERAL DETAILS :-

1.1 TERMINAL/DEPOT COMMISSIONED ON : 27.9.95
1.2 EMERGENCY RESPONSE FINALISED ON : 27.7.97
1.3 EMERGENCY RESPONSE PLAN LAST UPDATED ON : 14.2.98
1.4 PREVIOUS ERD CONDUCTED ON : 15.4.99
1.5 LAST ERD CONDUCTED ON : 15.4.99
1.6 FIRE ALARM GIVEN BY S/Sh : ...SH. J. SAYAL...AT 10:50 HRS
1.7 ALL CLEAR SIGNAL GIVEN BY S/Sh : ...SH. J. SAYAL...AT 11:15 ..HRS
1.8 FIRE-IN-CHIEF : NAME... SH. J. SAYAL ...
DESIGNATION. TERMINAL MANAGER

2.0 'MOCK EMERGENCY' DETAILS :-

2.1 LOCATION OF 'MOCK' EMERGENCY (e.g. TLF, TANK FARM etc) : TANK FARM AREA
2.2 NATURE OF 'MOCK' EMERGENCY SPECIFY EXACT DETAILS. viz-WHETHER ONLY 'SPILLAGEE' OR 'FIRE' OR 'SPILLAGE WITH FIRE') : SPILLAGE WITH FIRE
2.3 EXACT SPOT/SOURCE OF SPILLAGE/FIRE : MANIFOLD OF TK 403C.
2.4 ACTION PLAN TO COMBAT EMERGENCY :

1. 10KG DCP TO BE DISCHARGED AT ROOT OF FIRE.
2. THE AFFECTED TANK & NEARBY TANKS 403B & 401A TO BE COOLED BY SPRINKLER.
3. BODY VALVE OF TK 403C IS TO BE CLOSED BY PERSON WEARING FIRE ENTRY SUIT.
4. APPLICATION OF FOAM BY USING 200 LT FOAM TROLLEY & 1000 GPM WATER-CUM-FOAM MONITOR.
5. CONTROL OF FIRE ON OIL SPILLED ON THE GROUND BY USING WATER CURTAIN NOZZLE & FOAM GENERATOR.

2.5 "POSSIBLE CAUSE" AS PER AVAILABLE EVIDENCE (TO CO-RELATE WITH 2.1, 2.2 & 2.3) : FAILURE OF 'O'-RING.

...2

3.0 AGENCIES INVOLVED/RESPONSE TIME :-

3.1 AGENCY : FIRE BRIGADE
TIME CONTACTED : 10:50 HRS
TIME HELP REACHED : 11:00 HRS
ACTUAL RESPONSE TIME : 10 MIN
PLANNED RESPONSE TIME : 10 MIN
LEFT DEPOT/TERMINAL AT : 11:15 HRS
WHETHER HELP RENDERED AS PER PLAN (WRITE 'YES/NO' WITH BRIEF DETAILS) : YES. TENDER CAME WITH 7 FIREMEN AND HELPED IN FIRE FIGHTING.

3.2 AGENCY : AMBULANCE
TIME CONTACTED : 10 51 HRS
TIME HELP REACHED : 11 05 HRS
ACTUAL RESPONSE TIME : 14 MIN
PLANNED RESPONSE TIME : 14 MIN
LEFT DEPOT/TERMINAL AT : 11-15 HRS
WHETHER HELP RENDERED AS PER PLAN (WRITE 'YES/NO' WITH BRIEF DETAILS) : YES. ONE DOCTOR WITH THREE ASSISTANTS HAD COME.

3.3 AGENCY : BPCL
TIME CONTACTED : 10 . 52. HRS
TIME HELP REACHED : 10 57 HRS
ACTUAL RESPONSE TIME : 5 MIN
PLANNED RESPONSE TIME : 5 MIN
LEFT DEPOT/TERMINAL AT : 11:15 HRS
WHETHER HELP RENDERED AS PER PLAN (WRITE 'YES/NO' WITH BRIEF DETAILS) : YES ASSISTED IN FIRE FIGHTING

3.4 AGENCY : HPCL
TIME CONTACTED : 10 53 HRS
TIME HELP REACHED : 10' 57 HRS
ACTUAL RESPONSE TIME : 4 MIN
PLANNED RESPONSE TIME : 4 MIN
LEFT DEPOT/TERMINAL AT : 11:15 HRS
WHETHER HELP RENDERED AS PER PLAN (WRITE 'YES/NO' WITH BRIEF DETAILS) : YES. ASSISTED IN FIRE FIGHTING

3.5 AGENCY : IOCL (PIPELINE DIVISION)
TIME CONTACTED : 10:54 HRS.
TIME HELP REACHED : 10'57 HRS
ACTUAL RESPONSE TIME : 3 MIN
PLANNED RESPONSE TIME : 3 MIN
LEFT DEPOT/TERMINAL AT : 11:15 HRS
WHETHER HELP RENDERED AS PER PLAN (WRITE 'YES/NO' WITH BRIEF DETAILS) : ASSISTED IN FIRE FIGHTING

3.6 AGENCY : POLICE
TIME CONTACTED : 10:55 HRS
TIME HELP REACHED : 11:00 HRS
ACTUAL RESPONSE TIME : 5 MIN
PLANNED RESPONSE TIME : 5 MIN
LEFT DEPOT/TERMINAL AT : 12:00 HRS
WHETHER HELP RENDERED AS PER PLAN (WRITE 'YES/NO' WITH BRIEF DETAILS) : YES ASSISTED IN COMBATING FIRE & HANDLING EMERGENCY.

3.7 AGENCY : CIVIL DEFENCE
TIME CONTACTED : 11:00 HRS
TIME HELP REACHED : 11:10 HRS
ACTUAL RESPONSE TIME : 10 MIN
PLANNED RESPONSE TIME : 10 MIN
LEFT DEPOT/TERMINAL AT : 12:00
WHETHER HELP RENDERED AS PER PLAN (WRITE 'YES/NO' WITH BRIEF DETAILS) : IMPARTED TRAINING IN HANDLING EMERGENCY.

3.8 AGENCY :
TIME CONTACTED :
TIME HELP REACHED :
ACTUAL RESPONSE TIME :
PLANNED RESPONSE TIME :
LEFT DEPOT/TERMINAL AT :
WHETHER HELP RENDERED AS PER PLAN (WRITE 'YES/NO' WITH BRIEF DETAILS) :

3.9 AGENCY :
TIME CONTACTED :
TIME HELP REACHED :
ACTUAL RESPONSE TIME :
PLANNED RESPONSE TIME :
LEFT DEPOT/TERMINAL AT :
WHETHER HELP RENDERED AS PER PLAN (WRITE 'YES/NO' WITH BRIEF DETAILS) :

4.0 THREE MAJOR SHORTCOMINGS OF THE PREVIOUS ERD :-

4.1 MONITOR ~~[illegible]~~ OPERATION WAS NOT PROPER (DIRECTION-WISE)

4.2 THROW OF 900 LT FOAM TROLLEY WAS OBSTRUCTED BY PRODUCT P/L.

4.3 EMPLOYEES WERE GOING TOO NEAR THE SITE FOR FIRE FIGHTING

...4

5.0 RESPONSE TIME AT TERMINAL/DEPOT :-

5.1 TIME/RESPONSE TIME (TO BE CALCULATED FROM SPOTTING OF EMERGENCY)

EVENT	TIME (0000 HRS)
i) FIRE ALARM SOUNDED AT :	10 50
ii) FIRST F/E DISCHARGED :	10:51
iii) SECOND F/E	10·52
iv) THIRD F/E	10 .53
SPRINKLING OF TK. 403B	10 ·53
(7th HOLD	
900 LT. FOAM TROLLEY &	10:57
1000 GPM FOAM MONITOR	
WATER-CUM-FOAM NOZZLE	11·08
& FOAM GENERATOR	
ALL CLEAR SIGNAL AT :	11·15

6.0 EFFICIENCY OF FIRE EXTINGUISHERS :-

6.1 10 KG DCP TYPE
NOS. OPERATED : THREE
WORKED SATISFACTORILY : ALL DISCHARGED SATISFACTORILY.

6.2 60/70/75 KG DCP TYPE
NOS. OPERATED :
WORKED SATISFACTORILY :

6.3 150 KG DCP TYPE
NOS. OPERATED :
WORKED SATISFACTORILY :

6.4 CO_2 TYPE
NOS. OPERATED :
WORKED SATISFACTORILY :

6.5 ANY OTHER TYPE
NOS. OPERATED :
WORKED SATISFACTORILY :

7.0 WHAT WENT OFF WELL (PLEASE SPECIFY BELOW)

7.1 DISCHARGE OF DCPs

7.2 COOLING OF NEARBY TANKS

- APPLICATION OF FOAM ON AFFECTED TANK USING 900 LT. FOAM TROLLEY & 1000 GPM WATER-CUM-FOAM MONITOR
- TIMELY RESPONSE FROM EXTERNAL AGENCY
- ADMINISTRATION OF FIRST AID.

....

8.0 WHAT WERE THE DRAWBACKS / WHAT WAS THE ACTION PLAN

DRAWBACKS	ACTION PLAN
THROW OF WATER-CUM-FOAM MONITOR WAS OFF THE TARGET INITIALLY.	FIRE FIGHTING TEAM NEEDS TO IMPROVE CO-ORDINATION IN FUTURE DRILLS.

9.0 LESSONS LEARNT AND TRAINING IMPARTED :-

TRAINING WAS IMPARTED FOR FIGHTING DIFFERENT TYPES OF FIRES WHICH CAN OCCUR IN A PETROLEUM TERMINAL.

10.0 OTHER SPECIFIC DETAILS (IF ANY) :

SIGNATURE
NAME B.SAHAL
DESIGNATION TM JAIPUR

SIGNATURE
NAME G.K.SHARMA
DESIGNATION DY.MGR(L&L)

Hot Work Permit

ANNEXURE – 22

INDIAN OIL CORPORATION LTD. (MD)
JAIPUR—TOP, SANGANER

HOT WORK/VESSEL ENTRY/VESSEL BOX–UP/EXCAVATION

(Strike out boxes not applicable) Sr. No. 400

Form : F/SAF 0 - 98

VALID FROM ______________ TO ______________

PERMISSIONIS GRANTED TO SECTION/CONTRACTOR __________ NAME __________

NATURE OF WORK ________________________________

LOCATION OF WORK ________________________________

THE FOLLOWING ITEMS SHALL BE CHECKED BEFORE ISSUING THE PERMIT :

Item	Done	Not Reqd
1. Equipment/Work Area inspected	☐	☐
2. Surrounding area checked, cleaned up oil (rags/grass etc. removed)	☐	☐
3. Sewers, manholes, CBD etc. and hot surfaces nearby covered	☐	☐
4. Considered hazard from other routine/non-routine operations and concerned persons alerted	☐	☐
5. Equipment electrically isolated & tagged	☐	☐
6. Fire water hose, Portable extinguisher provided	☐	☐
7. Fire Water System checked for readiness	☐	☐
8. Equipment blinded disconnected closed/isolated/wedged oped	☐	☐
9. Equipment properly drained/depressurised	☐	☐
10. Equipment properly steamed/purged	☐	☐
11. Equipment water flushed	☐	☐
12. Gas oxygen deficiency test done and found OK	☐	☐
13. Shield against sparks provided	☐	☐
14. Proper ventilation & lighting provided	☐	☐
15. Proper means of exit provided	☐	☐
16. Precautionary tagboards provided	☐	☐
17. Portable equipment nozzles properly grounded	☐	☐
18. Standby Personnel provided for vessel entry	☐	☐
19. Standby personnel provided for fire watch from Process/Maint/Contractor/Fire Dept	☐	☐
20. Iron Sulphide removed/kept wet	☐	☐
21. Area cordoned off	☐	☐
22. Precautions against public traffic taken	☐	☐
23. Clearance obtained for excavation from Technical concerned Depts	☐	☐
24. *Clearance obtained for road cuting from Technical, Fire/concerned Depts	☐	☐
25. Clearance obtained for dike cutting	☐	☐
26. Checked Flame arrestor on mobile equipment	☐	☐
27. Checked for oil gas trapped behind lining in equipment	☐	☐

Note :—For items marked *clearance to be obtained from higher designated authority.

SPECIAL INSTRUCTIONS

1. Following personnal protective equipment are required (check all items required).
   Safety hat/Gloves/Goggles/Safety Shoes/Boiler Suit/Welding Suit.
   Dust Respirator/Face Shield/Fresh Air Mask/Apron/Lifeline/Safety Belt.
2. In case of fire clam, all work must be stopped. All personnel must leave work site and proceed to designated areas.
3. In case of liquid/gas release, Stop work and immediately advise concerned operation personnel.
4. Only certified vehicle engines and permitted type of electrical equipment and tools are used in operating areas.
5. Ensure proper grounding/earthing/insulation of cablas.
6. This permit must be available at the work site at all times.
7. Additional remarks, If any ....

....

Name and .... Name and ....

Signature of Issuer .... Signature of Receiver ....

GAS TEST (HYDROCARBON/TOXIC GAS/OXYGEN DEFICIENCY) DONE				PERMIT EXTENDED UP TO			SIGNATURE	
DATE	TIME	TAKEN BY	REMARKS	DATE	TIME	Additional Precautions Required if any	Issuer	Receiver

NOTE :—HOT WORK INCLUDES WELDING, BURNING, GRINDING, SOLDERING, SAND BLASTING, CHIPPING, RIVETING, DRILLING, CAMERA FLASHING, POWER TOOLS, IC ENGINE OPERATIONS/ENTRY, OPEN FLAME.

WORK COMPLETED/STOPPED/AREA CLEARED AT ______________________

By ______________________
Signature

(PLEASE RETURN PERMIT TO ISSUER)

____
Name

STATUS : LAST OISD EXTERNAL SAFETY AUDIT

LAST EXTERNAL AUDIT ON :

SR. NO.	CATEGORY	NO. OF POINTS	REMARKS
01	TOTAL ACTION POINTS	NA	
02	ACTION COMPLETED	NA	
03	PENDING POINTS (01-02)	NA	
	A) Under Implementation b) Action Not Initiated		

STATUS OF PENDING POINTS

Sr.No.	Checklist Ref. No.	Pending Points in brief	Status/Remarks

---------NA----------

STATUS : LAST ELECTRICAL SAFETY AUDIT

LAST EXTERNAL AUDIT ON : 21.5.97 BY PDIL

SR. NO.	CATEGORY	NO. OF POINTS	REMARKS
01	TOTAL ACTION POINTS	-	REPORT AWAITED FORM PDIL
02	ACTION COMPLETED	-	
03	PENDING POINTS (01-02)	-	
	A) Under Implementation b) Action Not Initiated		

STATUS OF PENDING POINTS

Sr.No.	Checklist Ref. No.	Pending Points in brief	Status/Remarks

---------N.A.---------

INTER OFFICE MEMO

FROM : TERMINAL MANAGER, JAIPUR
TO : COM, RSO
DATED : 15-7-2000
REF : SNR/RSO CORRES/2000

SUB : COMPLIANCE STATUS OF PDIL INSPECTION

Following is the point wise compliance status of the PDIL inspection conducted on 13 & 14-8-99

1) Internal earthing of FLP motors completed and necessary termination at substation also completed
2) FLP glanding checked at all places and necessary maintenance like weather proofing and tightening of glands completed.
3) Paraplast compound filled in terminal boxes of FLP motors.
4) New earth pit created for neutral aearthing of DG sets
5) Knife switch has been installed on the neutral circuit of DG – 1 & DG-2 in the synchronisation panel
6) Neutral earthing of generators done as per code and terminated directly at earth pit
7) Suggested changes in single line diagram completed
8) The high mast tower motors are situated beyond the distance specified in OISD 118. Hence no action has been taken with regard to this point as it is already compliant.

(R. Saval)
Terminal Manager

STATUS : LAST INTERNAL SAFETY AUDIT

LAST INTERNAL AUDIT ON : 15.4.96

SR. NO.	CATEGORY	NO. OF POINTS	REMARKS
01	TOTAL ACTION POINTS	1	-
02	ACTION COMPLETED	1	-
03	PENDING POINTS (01-02)	NIL	-
	A) Under Implementation b) Action Not Initiated		

STATUS OF PENDING POINTS

Sr.No.	Checklist Ref. No.	Pending Points in brief	Status/Remarks

----------NIL--------------

List of Statutory Approvals / Permits **Annexure 24**

S.No.	Statutory License	Date of Renewal
1	CCE License	31-12-2001
2	Factories License	31-3-2001
3	Pollution Certificate	31-12-2000
4	Labour Registration	--
5	Operating License For DG	--
6	Form CT – 1 AS R-1	31-12-2000
7	Form CT-1 AS R-2 Cert. Holder	31-12-2000
8	Excise Registration	31-12-2000
9	Public Liability Insurance	31-3-2000 to 30-3-2001
10	WEM Cert. For Prover Tank (500 L & 1000 L)	9-4-2001
11	W & M Cert. For Flowmeters	9-4-2001
12	W & M Cert. For Prover Measure (20L), Weighing M/C, DIP Tape & Inch Tape	--

Rating Construct

Operations and Maintenance: A

Parameter - I	Parameter - II	Rating Categories			Rating
		A	B	C	
Tanks and tank farm					A
Constructional requirements	Interdistance between tanks	Adequate	Minor gaps	Guidelines not followed	
	Adequacy of height of the dyke wall and fire wall, circumferential drains	Provision of appropriate heights and drainage collection	Minor gaps in either	Gaps in both	
	Adequacy of the type of vents and seals	Provide for an effective control of leakages	Minor gaps in either	Inefficient provisions/operation	
	Provision of Motorable roads	Alternative access provided for each facility	Minor gaps	Major gaps	
	Provision of local controls and displays	Provided adequately and operating normally	Minor problems in operation	Major gaps	
	Display of the tank information	Proper as per guidelines	Minor gaps wrt number of displays, adequacy of size of display etc	Recommended guidelines not followed	
Tank health	Foundation settlement and undulations in tank	Nil	Minor gaps	Settlements observed	
	Thickness of tank wall	Monitored regularly with no corrosion	No corrosion observed but irregular monitoring	Corrosion recorded	
	Support conditions of the inlet and outlet pipelines	Adequately supported	Adequately supported with minor lapses	Supports not provided/ maintained properly	
	Condition of painted surface	Well maintained	Poor paint quality at some of the locations	Poor paint quality at most of the locations	
	Condition of rim seal in MS tanks	In a good condition and checked regularly	In good condition but minor gaps in checking procedures	Seal in poor condition	
	Condition of tank ladder and walkways	Good	Minor gaps	Not good from operational point of view	
	Leakages	Leaks/ sweating not visible	Minor leakages visible	Observed at many locations	
Maintenance procedures	Tank cleaning- general		Not applicable		
	Tank cleaning for product change	Standard practices followed and adequate cleaning equipments available	Minor gaps	Major gaps	
	Calibration of local and automatic gauges	Done thoroughly and regularly	Minor gaps	Major gaps	
Safety measures	Provision of the earthing strips	Exist in a good health	Minor discrepancies	Major gaps observed	
	Expansion line on pipelines and connection to tanks	Provided adequately	Minor discrepancies	Inadequate provisions	
Pipelines					A
Pipeline health					
	Condition of supports	Properly supported	Minor gaps	Not proper at many locations	
	Leakages from the flange joints	Not observed	Minor gaps	Observed at some locations	
	Condition of painted surface, wrapping coating	Good	Minor gaps	Poor	
	Vegetation growth below the pipeline	Generally nil	Some vegetation growth observed	High vegetation growth observed	
Pipeline maintenance procedures					
	Color coding practices	Adhered to strictly and uniformly	Minor gaps	Major gaps	
	Schedule of painting		Not applicable		
	Hydrotest for u/g piping		Not applicable		
	Approach to all segments of the pipeline	Accessible	Poor at some locations	Generally poor	
Tank Trolleys(TTs)					A

Operations and Maintenance: A

Parameter - I	Parameter - II	Rating Categories A	 B	 C	Rating
Requirements for selection of tank trucks		Well defined, observed, communicated and updated regularly	Minor gaps	Major gaps	
Control procedures for tank		Well defined and practised	Minor gaps	Major gaps	
Displays on tank trucks		Adequate for ownership, product information, contact details etc	Minor gaps	Major gaps	
General operational control and support for TT operations	Safety checks, Maintenance of TTs	Adequate with regular safety checks	Minor gaps	Major gaps in both	
Tank truck gantry					A
Operational control	Loading systems	Fully automated	Partial automation	Manual operations	
	Mechanisms to check operational spillages	In place and efficient functioning	Minor gaps in either	Systems not in place with spillages	
	Mechanism for isolation of loading header	Mechanisms provided and running efficiently	Mechanisms provided but some gaps in operation	Mechanisms not provided	
Contingency controls	Earthing of structure, Provisions to arrest frictional sparks, Colour coding	Adequate	Minor gaps	Major gaps	
Tank lorry decantation		Minimum usage with clean operations	High usage frequency with clean operations	High usage frequency with operations not managed properly	
General housekeeping		Good	Minor gaps	Poor	
Pumps & Valves					A
General condition of pumps	Seals, glands and filters	All in good condition with regular cleaning and maintenance procedures	Minor gaps	Generally poor	
	Vibrations	Minimal levels	Occasionally high	Major vibration felt	
Condition of hammerblind and drain valves		All valves in position and in a leak free state	Minor leakages	Major	
Condition of the control and automated valves		Well- maintained with regular calibration	Minor gaps	Major gaps	
Pump/valve maintenance	Record keeping	Done regularly and records maintained properly	Minor gaps	Major gaps	
Lube oil storage & Furfural Doping					A
Stacking of lube oil storage barrels		Proper and confined to approved area	Minor misarrangements	Not managed properly	
Storage of furfural		Separate storage provided	Storage not separate but necessary precautions taken	Storage not as per standard requirements	
Contingency provisions & availability of PPEs at both		Adequate	Minor gaps	Major gaps	
Operational Control During Receipt and Transfer of Product					A
Product receipt/ testing/ transfer procedures	Record keeping	Operations ensure minimal wastages, adequate safety with proper record keeping	Minor gaps	Major gaps in operations	
Provisions to check overflows in tanks and TTs	Past track of overflows	Adequate provisions with no past history of spills/ overflows	Adequate provisions with some leakages reported in the past	Major gaps	

Pollution and Resource intensity: A

Parameter - I	Parameter - II	Rating Categories			Rating
		A	B	C	
Pollution: Air					A
Stack emissions					
Stack Emission levels			N/A		
Monitoring & testing facilities/ arrangement			N/A		
Knowedge of staff (if own monitoring)			N/A		
Qlty of measurement & record keeping			N/A		
	Frequency				
	Availability & quality of information				
Ambient Air Quality					
AAQ level		Satisfactory / As per consent	Minor gaps for some parameters	Major non-compliance	
Monitoring & testing facilities/ arrangement	Availablity and adequacy	Adequate	Minor gaps	Major gaps in both	
Knowedge of staff (if own monitoring)			N/A		
Monitoring of additional pollutants	Ambient levels of the additional pollutants	Monitored regularly and levels satisfactory	Monitored but exceeds levels	No initiative taken	
Qlty of measurement & record keeping	Frequency	Periodic/ As per Consent	Minor gaps	Major gaps in system	
	Availability & qlty of info.	Adequate, reliable data	Minor gaps	Poor information tracking and recording	
Afforestation	Green belt in/around the premises	Adequate	Average	Inadequate	
Pollution: Water					A
Plant drainage layout		Available	Available but lacks some information or not updated properly	Not prepared	
Wastewater collection	From all locations	System provided for proper collection from all locations	Minor gaps	Major gaps	
	Operational performance	Satisfactory	Wastewater stagnations observed at some locations	Gaps observed	
Treatment and disposal of treated w/w and slop oil	Functioning of oil water separator	Satisfactory	Some gaps in frequency of operation	Yes but with some lapses	
Water effluent discharge	Quantity	Zero discharge	Partial discharge as per consent requirements	Exceeds the consent conditions	
	Quality	Satisfactory	Minor gaps	Yes + Some lapses	
Ground water quality	Monitoring systems and frequency	Done regularly	Minor gaps in either	Not done	
	Deterioration in quality	No impact observed	Minor gaps	Significant impacts observed	

Pollution and Resource intensity: A

Parameter - I	Parameter - II	Rating Categories			Rating
		A	B	C	
Monitoring & testing facilities/ arrangement	Availablity and adequacy	Adequate	Minor gaps	Major gaps in both	
Knowedge of staff (if own monitoring)			N/A		
Record keeping	Frequency	Periodic/ As per Consent	Minor gaps	Major gaps in system	
	Availability & qlty of info.	Adequate, reliable data	Minor gaps	Poor information tracking and recording	
Pollution: Noise					A
Noise monitoring & testing facilities/ arrangement	Frequency as per guidelines	Adequate arrangements at regular frequency	Minor gaps	Inadequate arrangements with monitoring at erratic frequency	
Noise levels(dBA)		Within limits at all locations	Exceed limits slightly	Major gaps	
Pollution: Solid Waste					
Storage facilities (if hazardous)			NA		
Disposal & tptn systems			NA		
Reuse			NA		
Monitoring systems			NA		
Resource Intensity					B
System to track consumption	Efforts to reduce consumption	System of auditing and tracking in place with periodic analsis and follow-up	Minor gaps	Consumption levels increasing disproportionately	
Trends in consumption		Decreasing consumption levels	Constant consumption levels	Increasing per unit of production	

Work Environment: A

Parameter - I	Parameter - II	Rating Categories A	Rating Categories B	Rating Categories C	Rating
Noise Exposure					A
Exposure [dBA]		Within OSHA limits	Exceeds limits occasionally	Exposure limits increase most of the times	
Safeguards (Earmuffs, Cabins)	Ear protection where noise lvl exposure(8 hr)>= 90dBA	Yes	Provided adequately but some gaps in use	Gen'ly No	
Air Quality					A
Exposure level		Very low	High in some particular area	High in many areas	
Safeguards used	(where applicable)	Yes	Minor gaps	Inadequate	
Housekeeping					A
General housekeeping	In pump-houses and loading gantries	Minimal spills	Minor gaps	High floor contamination	
	Surface drains	Well lined and clean	Minor gaps at some locations	Overflowing and not in good condition	
	Grass cutting	Done regularly	Minor gaps	Considerable vegetation growth observed	
Ventilation & Illumination		Satisfactory	Minor gaps at some locations	Poor	
Confidence Factors					A
H & S systems					
Monitoring of in-plant condns	Aspects covered	All	Main	Gaps	
	Frequency	Regularly		Gaps	
	Monitoring facilities		NA		
Safety awareness in employees	Posters, notices advising safety measures	Yes		None	
Health check-ups, records	Regularity, Details, Coverage	Yes (All 3)	Gaps in either	Major gaps	
Medical infrastructure					
	Facilities/ Eqpt (Adequate, Func'l)	Yes- AF	Yes- AF	Yes- Basic	
	Med. personnel (No. & Skills)	Yes- NS	Yes- NS	Yes- S	

Contingency Management Systems: B

Parameter - I	Parameter - II	Rating Categories A	 B	 C	Rating
Past Track Record					A
Incidents in the past 2 years		None	Minor	Major	
Reporting and recording methodology & availability of past records		Proper for last 3years	Minor gaps	Major gaps	
Contingency Plan					B
Updation of CMP	*Approval of CMP by authorities*	Regular & Approved	Minor gaps	Major gaps	
Scope Risk Analysis	Hazard identification: Type of incidents addressed	Appropriate	Minor gaps	Inadequate	
	Risk Analysis methodology	Comprehensive methodology (physical effects & damage)	Gaps in the methodology	Inadequate	
	Risk reduction recommendations	Adequate	Minor gaps	Gaps	
Disaster management plan	On-site emergency plan and coverage of action points	Adequate scoping and coverage of emergencies	Gaps	Inadequate coverage of action points	
	Infrastructure to handle emergencies as specified in DMP	Adequate	Minor gaps	Inadequate	
	Contact details of key personnel	Updated information readily available	Minor irregularities in update	Not available	
	Offsite assistance plan: Covers contact details of liasion agencies	Updated information readily available	Partially available	Not available	
Contingency Prevention / Management Systems					A
Fire fighting capabilities	Infrastructure availability at site	Appropriate	Minor gaps	Major gaps	
	Health of infrastructure	Good	Some gaps observed	Not appropriate	
	Maintenance procedures for infrastructure	Regular with record keeping	Regular but with inadequate record keeping	Not defined well	
	Water storage capacity	Adequate In-house with additional sources of availability	Adequate but needs to improve on additional source availability	Highly inadequate	
	Water pressure in the fire water network	Requisite design pressure maintained at the remotest point	Decreasing frequently	Not maintained adequately	
Communication systems	Infrastructure for effective communication	Adequate	Minor gaps	Major gaps	
	Provision of sirens at strategic locations	Provided	Provided but not functioning properly	Not provided adequately	
Security systems	Adequacy and efficacy of operation	Excellent	Good	Gaps	
Efficacy of CMP / DMP					A
Frequency of CMP testing including fire & safety drills					

Contingency Management Systems: B

Parameter - I	Parameter - II	Rating Categories			Rating
		A	B	C	
	Involving plant personnel	Quarterly	Half yearly	Erractic drills	
	Involving external agencies	Carried out regularly	Carried out intermittently	Not carried out	
Procedures for follow up	Recording	Well recorded and proper follow up	Minor gaps in either	Major gaps	
Personnel- Skills, level of awareness		Satisfactory	Minor gaps in either	Not adequate	
Emergency control centre		Exists and well equipped	Exists with minor gaps	Exists with major gaps	
Display of contacts for handling emergency situations		Adequate	Inadequate	Not in place	
Trainings- Fire, safety and first-aid	For employees and TT crew	Regular and for all aspects, covers all employees and crew	Training coverage partial	Regular training not imparted	
System for audits	Frequency and follow-up of important recommendations	Audits regular, well-scoped and proper follow-up	Gaps in either	Improper system of audits and follow-up actions	

Environmental Management Systems: A

Parameter - I	Parameter - II	Rating Categories				Rating
		A	B	C (if not C, then D)		
Past Track Record						
Notices/ penalties/charges by regulatory bodies	(In past 2 yrs)	Nil	No outstanding issues	No prosecn in last 6 mths		A
Public complaint/ litigations	(In past 2 yrs)	Nil	No outstanding issues	No prosecn in last 6 mths		
Requisite approvals/ permits/ consents	Availability	Complete	Complete with minor gaps	No major omissions		
	Timely renewals	Always ensured	Mostly on time	Generally delays		
Regulatory Reporting	Regularity	Timely submission	Occassionally on time	Generally delays		
	Authenticity	Insignificant variations	Minor variations	Generally minor variations, occasionally significant ones		
Policy and Planning						B
Environmental Policy	Existence & Scope	Yes, goes beyond legal reqts, to reflect concern about potential liabilities	Yes, to comply with regulations affecting the business	Not specified/ Does not exist	C	
System for identifying env'l impacts	Existing and/or new activities	Yes, for both	Yes, for existing/ new activities	Does not exist	C	
System for (1)identifying, (2)accessing, (3)updating lega	Existence & Scope	Yes, well defined & formal system for all three; Covering legislations & other applicable	Yes, but not for all	Adhoc/ Does not exist	B	
Env'l Objectives & Targets	Existence & scope	Yes covering all major environmental aspects	Yes, covering some environmental aspects	Does not exist	C	
	Monitoring progress	EPIs are set, periodic monitoring	No EPIs/ Occasionaly monitored	Not monitored	B	
Implementation						A
Allocation of financial resources	Existence & scope - Capital + O&M	Part of general budget; Fully adequate for all envt. related expenditure	Part of general budget; Mostly adequate for envt. related expenditure	Adhoc allocation/ No budgeting/ Inadequate	B	
Allocation of manpower	Existence, scope & adequacy	Yes, dual resp. with other functions; Adequate	Yes, dual resp. with other functions, Inadequate	Adhoc allocation/ Inadequate manpower	A	
	Responsibility	Yes, well-defined, clear responsibility structure	Yes, clear responsibility structure - with some ambiguities	Ad-hoc	A	
	Env'l in-charge at plant - reporting line	Reports to unit head & corp off directly	Reports to unit head or corp off	Reports to unit head/ senior mgmt at plant	B	
Training- Env'l awareness and skills; Motivation	Regularity/ participation (levels & departments)	Regular & ad-hoc; all levels; all deptts	Periodic; select levels; env'l deptt	None	C	
	Employee involvement & recognition	Schemes for suggestions, complaints, awards etc.	For any of these	None		
Communicn & reporting (External)	Scope	Beyond regul. reporting reqts.	As per regul. rptg reqts	None	B	
Communicn & reporting (Internal)	Scope		N.A.		B	
	Review level	Group env'l / operations head and Unit head	Corporate office (some level) and Unit head	Snr mgmt at plant	B	
Operational controls - Line accountability	Operating manuals/ instructions		N.A.			
	Internal processes (e.g. meetings)	Rigorous follow up through internal processes	Some follow up through internal processes	No	B	
Measurement & Evaluation						B
Measuring & Monitoring	Scope	Comprehensive (progress/ legal/ resource use etc.)	Generally for all legal & resource use purposes	Only for legal purposes	B	

Environmental Management Systems: A

Parameter - I	Parameter - II	Rating Categories A	 B	 C (if not C, then D)		Rating
Documentation & records	Maintenance & Adequacy	Excellent, sufficient, updation	Adequate, with some gaps	Basic minimum/only legal records	B	
Env'l Audits	Frequency	At least annual	Periodic/ Occasional	Rarely ever	A	
	Scope of audit	Beyond legal purposes	Only for legal purposes	None	B	
	Type of auditors	External, qualified auditors	Internal but independent (e.g. from other plants)	Internal / Self audits		
	Review level of audit rpt	Function head and unit head	Either of the two	Only env function at plant	A	
	Corrective/Preventive Action	Appropriate, follow-up	Generally appropriate but no/occassional follow-up	Inappropriate/ not undertaken	B	
External recognition/certification/awards		Already obtained	Working towards it	Neither A or B	B	
External Stake Holder Investment						A
Local community	Welfare initiatives	Good	Average	Minimal	B	
	Perception	Very positive image	Generally positive	Not positive	B	
Govt./regulatory agencies	Involvement/ interaction	Active	Reactive	Minimal	A	
Suppliers/Contractors/ Customers etc.	Env'l performance improvement	Encouraging & supporting	Slight involvement	Not bothered	B	